467-A-7

HE 20.8217/2:D 84

National Institute on Drug Abuse

TREATMENT RESEARCH MONOGRAPH SERIES

COMPLETED
ORIGINAL

DRUG AND ALCOHOL ABUSE

Implications for Treatment

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Alcohol, Drug Abuse, and Mental Health Administration

National Institute on Drug Abuse
TREATMENT
RESEARCH
MONOGRAPH
SERIES

Edited by

Stephen E. Gardner, D.S.W.

DRUG AND ALCOHOL ABUSE

Implications for Treatment

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Alcohol, Drug Abuse, and Mental Health Administration

National Institute on Drug Abuse
5600 Fishers Lane
Rockville, Maryland 20857

The Treatment Research Reports and Monograph Series are issued by the Treatment Research and Assessment Branch, Division of Prevention and Treatment Development, National Institute on Drug Abuse (NIDA). Their primary purpose is to provide reports to the drug abuse treatment community on the service delivery and policy-oriented findings from Branch-sponsored studies, innovative service delivery models for different client populations, innovative treatment management and financing techniques, and treatment outcome studies.

This report was developed for the National Institute on Drug Abuse by Richard Katon Associates, Inc., under Contract No. 271-77-4504. The Eagleville Hospital and Rehabilitation Center, under NIDA grant, H81 DA 01113, was responsible for the instrument development and data collection which provided considerable information utilized in a number of the chapters in this volume.

The National Institute on Drug Abuse has obtained permission from the copyright holders to reproduce certain tables and figures which appear on pp. 24, 26, 28, 29, 30, 31, 33, 34, 35, 107, and 110.

Further reproduction of this material is prohibited without specific permission of the copyright holders. All other material contained in this report is in the public domain and may be used and reprinted without special permission. Citation as to source, however, will be appreciated.

The U.S. Government does not endorse or favor any specific commercial product or commodity. Trade or proprietary names appearing in this publication are used only because they are considered essential in the context of the studies reported herein.

DHHS Publication No. (ADM) 80-958
Printed 1981

CONTENTS

Page

Introduction 1

Chapter 1. The Effects of Combined Alcohol/Drug Abuse on Human Behavior
Sidney Cohen 5

Chapter 2. Current Patterns of Psychoactive Drug Use: Some Epidemiologic Observations
Harvey Alan Siegal 21

Chapter 3. Methadone Maintenance and Alcohol Use
Barry Stimmel 57

Chapter 4. The Role and Significance of Alcohol and Sedative Use in the Multisubstance Abuser: An Investigation of Two Patient Samples
Lewis L. Judd, Dean R. Gerstein, William G. Lee, Winifred B. Riney, and Kenneth I. Takahashi 75

Chapter 5. Crime and Alternative Patterns of Substance Abuse
James A. Inciardi 95

Chapter 6. Alcohol and Illicit Drug Use
D. Dwayne Simpson and Michael R. Lloyd 117

Chapter 7. Characteristics of Combined Opiate and Alcohol Abusers
Carl D. Chambers 131

BLANK PAGE

INTRODUCTION

There has been considerable concern expressed in recent years regarding problems caused by the combined use of drugs and alcohol. Clinical reports have described numerous problems in treating dual addictions; research studies have surfaced evidence that combined drug and alcohol use is of concern in nontreatment populations.

Clinicians have come to be concerned about the combinations of substances clients may be taking and recognize the need to alert the client to dangers and precautions. Increasingly there is the suggestion that the resolution of one drug problem may surface the existence or development of a different substance abuse problem.

Clinicians and administrators in drug abuse programs must also weigh the alternatives of treating alcohol problems within their own programs or referring clients to alcohol programs. Each alternative has its advantages and disadvantages, as for example, the agency's desire to treat the "whole" client compared to the advantages offered in a specialized referral.

In addition to clinical issues, there are also management questions involved at Federal, State, and local levels. At present, treatment dollars for drug abuse and alcohol abuse are channeled through two Federal agencies, the National Institute on Drug Abuse (NIDA) and the National Institute on Alcohol Abuse and Alcoholism (NIAAA), with varying guidelines and different reporting systems—the Client Oriented Data Acquisition Process (CODAP)[1] and the National Alcoholism Program Information System (NAPIS).[2] At the State and local levels, there are different types of organizational structures responsible for the administration of drug and alcohol programs. Approximately 30 States now have "combined" drug/alcohol Single State Agencies administering their drug and alcohol programs. Within the designation of a "combined agency," there are various organizational possibilities—from completely separate units monitoring drugs and alcohol, to an integrated approach where the particular substance involved has minimal effect upon monitoring.

From a research perspective there has been considerable evidence presented to document the extensiveness of combined drug and alcohol consumption.

O'Donnell et al. (1976) in a study of the nonmedical use of psychoactive drugs in young men ages 20 to 30 ($n = 2{,}510$), reported multiple drug use to be high with varying numbers of those using alcohol having used other drugs (marijuana, 57 percent; psychedelics, 23 percent; stimulants, 29 percent; sedatives, 17 percent; heroin, 6 percent; opiates, 20 percent; cocaine, 14 percent). In a review of literature from 1925 to 1972, Freed (1973) concluded that approximately 20 percent of alcoholics use at least one additional drug that could produce dependence.

Chambers et al. (1975) in a survey of approximately 30,000 respondents, reported approximately 10 percent of regular prescription drug users were considered heavy drinkers (based on Cahalan's 1964 criteria of *amount* consumed, *frequency* of drinking and *regularity* of drinking).

Varying percentages of combined drug/alcohol usage have been reported in studies of treatment populations.

Tuckfeld et al. (1975), in an NIAAA-funded study with the Research Triangle Institute, collected data from service deliverers in alcohol, drug, and related programs in four selected sites in the United States. The analysis indicated that 30 to 60 percent of all clients seen by alcoholism treatment facilities were using drugs in addition to alcohol at the time of admission (according to the clinicians interviewed), and 15 to 30 percent of these alcoholics were thought to be "abusing" drugs (abuse being defined as the nonmedical use of prescription drugs and/or the use of illicit drugs).

Statistics obtained in NIDA's recently completed Polydrug Research and Demonstration Project show that 22.5 percent of the clients who entered the various polydrug programs reported alcohol as the secondary drug of abuse (Wesson et al. 1978).

---

[1] The Client Oriented Data Acquisition Process (CODAP) is a required reporting process for all drug abuse treatment units receiving Federal funds for the provision of drug abuse treatment services.

[2] The National Alcoholism Program Information System (NAPIS) is a reporting system for all treatment programs receiving NIAAA funding.

The Drug Abuse Warning Network (DAWN), which is jointly sponsored by the Drug Enforcement Administration (Department of Justice) and NIDA over the last 4 years (1974–1977), consistently showed alcohol in combination with other drugs to be the second leading drug problem associated with visits to emergency rooms, crisis centers, and medical examiners in the 24 SMSAs taking part in the nationwide study (DEA and NIDA 1978).

The National Drug/Alcohol Collaborative Project (NDACP) conducted in 1974–77 was a jointly funded (NIDA/NIAAA) project designed to provide services to a mixed substance abuse (drugs and alcohol) population. In the past, drug and alcohol programs funded by the Federal Government were segregated, with the emphasis on treating either drug abusers or alcoholics. Ten demonstration treatment programs were funded in various geographic locations with one objective being to gather comprehensive evidence of lifetime as well as recent (last 3 months) use of 17 substances including coffee, tea, tobacco, and alcohol. Another objective was to test and develop effective treatment models, methods, and techniques for mixed substance abusers. The final sample consisted of 1,544 clients. The sample, while not designed to be representative, was drawn from programs having considerable geographic diversity (4 Northeast, 1 South, 3 Southeast, 1 Midwest, 1 West), was made up of 78 percent male, 22 percent female subjects, and was 64 percent white, 32 percent black, and 4 percent other ethnic groups. Clients' ages for each of the 10 programs ranged from an average of 18 to 40 years.

A fuller description of the NDACP treatment population is in a report entitled *The National Drug/Alcohol Collaborative Project: Issues in Multiple Substance Abuse*, Gardner, S. E., ed., DHEW Pub. No. (ADM)80-957. Washington, D.C.: Supt. of Docs., U.S. Govt. Print. Off., 1980.

PURPOSE OF THIS VOLUME

Based on the significant clinical issues raised, the decision was made to surface and examine key issues in combined drug and alcohol use. It was thought that such an effort would offer opportunities for program administrators, clinicians, and researchers to be made more largely aware of theoretical and clinical issues as well as recent studies that address treatment and administrative concerns. This volume resulted from the effort to meet that need. Selection of the various issues to be covered was premised upon both the intent to be practical to the reader as well as to approach the investigation of drug/alcohol abuse in a comprehensive way. It was determined that existing data bases that included drug and alcohol data should be utilized as much as possible. Consequently, emphasis was placed on the NDACP data base described above.

ORGANIZATION OF THE BOOK

The first chapter, entitled "The Effects of Combined Alcohol/Drug Abuse on Human Behavior" by Sidney Cohen, combines clinical and research evidence to give an understanding of the physical and psychological effects of different drug and alcohol combinations. This chapter provides the reader with some understanding of physical and psychological outcomes likely to result due to various combinations of substances.

Chapter 2, "Current Patterns of Psychoactive Drug Use: Some Epidemiologic Observations" by Harvey Siegal, provides the reader with findings regarding various use patterns of alcohol and drugs. The author has assembled studies on general population and treatment populations regarding use of licit and illicit substances, with the intent of providing the reader with some perspective surrounding the nature and extent of alcohol/drug use patterns. Dr. Siegal's effort is one of assembling existing research rather than collecting new epidemiological information.

The impact of alcohol use in a treatment setting is explored by Barry Stimmel in chapter 3, "Methadone Maintenance and Alcohol Use." In this chapter, Dr. Stimmel defines the problems of alcohol and heroin use both statistically and in terms of treatment procedures within methadone maintenance programs. Medical evidence of dysfunction among drinking narcotic addicts and persons on methadone maintenance is presented. Various aspects of dealing with an alcohol problem in a methadone program are discussed, including recognition and diagnosis of the problem, as well as the development of alternative treatment protocols covering both abstinence and controlled drinking.

In chapter 4, "The Role and Significance of Alcohol and Sedative Use in the Multisubstance Abuser: An Investigation of Two Patient Samples," Lewis Judd and his associates provide an in-depth examination of the sedative-alcohol abuser. Dr. Judd examines a series of demographic and psychosocial variables to determine whether joint use of sedatives and alcohol is associated with different behavior and characteristics than is seen with users of the substances individually, and whether special treatment protocols would be indicated for the multiple drug user.

Different facets of crime as related to patterns of substance abuse are examined in chapter 5, "Crime and Alternative Patterns of Substance Abuse" by James Inciardi. Dr. Inciardi looks at criminal activity in relation to substance use in a variety of settings. Emergency room sites, the NDACP program sites, and a series of field studies are included. In this last setting, the author presents findings of interviews with samples of varying antisocial groups—professional thieves, street heroin addicts, and members of a motorcycle pack.

Chapter 6, "Alcohol and Illicit Drug Abuse" by D. Dwayne Simpson and Michael R. Lloyd, was derived from a portion of the National Followup Study of Admissions to Drug Abuse Treatment in the DARP during 1969–71. The DARP (Drug Abuse Reporting Program) consisted of analyses of treatment outcome for large numbers of admissions from a series of participating drug programs. This chapter provides an examination of a followup sample of 1,409 clients from a total population (DARP cohort 1) of 11,303 admissions, and focuses on alcohol use and its relationship to illicit drug use and treatment at time intervals before, during, and after treatment. There is also an examination of alcohol consumption by clients admitted to different treatment modalities.

Chapter 7 is entitled "Characteristics of Combined Opiate and Alcohol Abusers" by Carl D. Chambers. In an attempt to better understand common elements underlying heroin/alcohol abuse, Dr. Chambers examines a series of demographic and psychosocial variables in three different groups: a diverse sample of substance abusers interviewed immediately prior to entering treatment, a group of active heroin addicts not in treatment, and a group of clients interviewed while undergoing treatment. The sequential use of alcohol and heroin is examined, as well as substitution patterns and perceptions of physical and psychological dependence.

Stephen E. Gardner, D.S.W.
National Institute on Drug Abuse

REFERENCES

Chambers, C.; Inciardi, J.A.; and Siegal, H.A. *Chemical Coping*. New York: Spectrum Publications, 1975.

Drug Enforcement Administration and National Institute on Drug Abuse. *Drug Abuse Warning Network, Phase V Report, May 1974-Apr. 1977*. Rockville, Md.: National Institute on Drug Abuse, 1978.

Freed, E.X. Drug abuse by alcoholics: A review. *The International Journal of the Addictions*, 3:451-473, 1973.

Gardner, S.E., ed. *The National Drug/Alcohol Collaborative Project: Issues in Multiple Substance Abuse*. Rockville, Md.: National Institute on Drug Abuse, DHEW Pub. No. (ADM)80-957. Washington, D.C.: Supt. of Docs., U.S. Govt. Print. Off., 1980.

National Institute on Drug Abuse. *Annual Summary Report 1976, Data from the Client Oriented Data Acquisition Process*. Statistical Series E, No. 4. Rockville, Md.: the Institute, 1978.

O'Donnell, J.A.; Voss, H.L.; Clayton, R.R.; Slaton, G.T.; and Room, R.G.W. *Young Men and Drugs*. Rockville, Md.: National Institute on Drug Abuse, 1976.

Tuckfeld, B.S.; McLeary, K.R.; and Waterhouse, G.J. *Multiple Drug Use Among Persons with Alcohol-Related Problems*. Springfield, Va.: National Technical Information Service, 1975.

Wesson, D.R.; Carlin, A.S.; Adams, K.M.; and Beschner, G., eds. *Polydrug Abuse*. New York: Academic Press, 1978.

Chapter 1
The Effects of Combined Alcohol/Drug Abuse on Human Behavior

Sidney Cohen, M.D.
Department of Psychiatry
University of California, Los Angeles

INTRODUCTION

In a study of the effects of a single drug upon behavior, the implications are manifold. Dosage levels, modes of administration, baseline states, the expectations of the subjects and of the investigators, the environments in which the drug is taken—all these variables and others as well make human psychochemical studies difficult and complex. When two or more drugs are used together or in sequence, the problems become magnified. Add to this analysis the vagaries of street drugs with their contaminants, adulterants, diluents and haphazard quality and quantity control, and the situation almost defies scientific scrutiny. Nevertheless, since polydrug use is notably prevalent, and shows no signs of becoming less so (O'Donnell et al. 1976), an effort must be made to estimate the nature of multiple drug abuse.

Of all polydrug patterns, those involving alcohol are the most frequently encountered and, perhaps, the most dangerous. The days when substance abusers were categorically labelled—as alcoholic, cokehead, hophead, pothead, and pillhead—seem to be rapidly disappearing. Instead, we are seeing people overinvolved with a primary substance of choice, but also using a variety of others depending on availability, price, social situation, peer group usage and the latest wisdom from the so-called underground press.

This chapter will review the available literature on alcohol and other drug interactions in humans. It will then attempt to provide information on the psychophysiologic effects of specific combinations. Finally, the impact of multiple drug use on certain behaviors will be described insofar as such effects are recorded in the literature.

The chapter will not include a discussion of methadone/alcohol combinations. Although the behavioral effects of methadone and alcohol are similar to those of alcohol and other opiates, the particular importance of alcohol to methadone maintenance treatment programs requires special attention to this combination.

Only selected sedative/alcohol relationships will be treated here since that subject requires a separate emphasis also.

A small number of definitions are provided below to assure a uniform understanding of the material that follows:

Tolerance is the need to increase the dose of certain regularly used drugs over time in order to achieve the same effects desired originally. Narcotics, sedatives, minor tranquilizers, alcohol, and amphetamines produce tolerance.

Cross tolerance. After tolerance to a drug has developed, tolerance to others in the same class or in related classes will be present. When someone is tolerant to a barbiturate, for example, s/he will be tolerant to other barbiturates, other sedatives, alcohol, and the minor tranquilizers.

Physical dependence (addiction). After tolerance has developed, the abrupt withdrawal of the drug will cause a pattern of symptoms called the withdrawal or abstinence syndrome. Tolerance, the withdrawal syndrome, and the desire or need to continue using the drug represent physical dependence.

Synergism. When two drugs act similarly they are synergistic.

Antagonism. When two drugs have opposing effects, they are antagonists.

Additive. When two drugs acting similarly are used together and the result is a simple summation of effect, they are considered to be additive.

Supra-additive (potentiation). When the effect of two synergistic drugs is greater than the sum of their doses, they are supra-additive.

Alcohol (ethanol) is a general anesthetic. Like other anesthetics, this drug manifests an initial period of depression of the inhibitory control mechanisms that is experienced as behavioral stimulation.

Certain reasons for multiple drug ingestions exist. The most obvious one is to enhance the effects of the basic mind-altering substance used. Alcohol is a central nervous system (CNS) depressant. Using other classes of depressants (narcotics, sedatives, minor tranquilizers, or volatile solvents) along with alcohol will, at a minimum, add to the depressant action. In certain instances the related drugs are supra-additive when used in combination with alcohol. These potentiating actions will be discussed further under the specific combinations of the depressant drugs with alcohol.

Another reason why more than one agent may be used is to counteract certain undesired effects of the basic psychochemical. Amphetamines make some users too tense and jittery ("wired up"), though euphoric. In such cases, alcohol is able to take the edge off of the tension state.

At times, combinations of drugs are used when the preferred agent is not at hand, is of poor quality, or is too expensive. During a heroin "panic," codeine cough syrup, propoxyphene (Darvon), alcohol, and marijuana—alone or in combination—may be substituted.

Finally, there is multiple drug use for its own sake, without particular concern about the niceties of what the potpourri of chemicals will do. There is still an occasional person who will take anything and everything that is available. This mindless ingestion of a bewildering array of psychotropic drugs has been called "the garbage head syndrome."

There are essentially two trends that combining psychopharmaceuticals can follow: (1) that of increasing central nervous system excitation or (2) that of increasing central nervous system depression. Alcohol, when combined with other depressants, can only increase sedation by an additive or potentiating action. When alcohol is combined with stimulants, the net effect might be to dampen or antagonize some of the undesired actions of the stimulant.

INTERACTIONS

The psychopharmacologic interactions of alcohol with other drugs are manifold. Three of the major levels of interplay that account for tolerance and cross tolerance are given below.

1. The presence of the drugs increases the amount of metabolizing enzymes responsible for their breakdown.
2. The response of the receptor cell—the neuron, for example—becomes more resilient to the action of the drugs by continued exposure.
3. The organism attempts to adapt to the presence of the mind-altering chemical by increasing its self-surveillance and monitoring functions.

These adaptive efforts at subcellular, cellular, and psychological levels result in a decreased effect of the drugs at their original dosage levels. If effects equivalent to the initial action of the drugs are desired, they can only be accomplished by consuming increased amounts of the agents.

Since the increased enzyme formation and the cellular and organismic adaptive efforts are often similar for other drugs in the same or related classes, cross tolerance develops along with tolerance. It should be emphasized that for tolerance and cross tolerance to occur, the drug or drugs must be consumed daily—usually a number of times a day for weeks or months.

Cross tolerance is important in understanding the combined, *chronic* use of alcohol and related drugs. It means that a chronic alcoholic who is *not* actively drinking will be relatively resistant to an anesthetic agent, a sleeping potion, or a tranquilizer. On the other hand, when that person is actively drinking, the other depressant drugs will be additive or even supra-additive so that less than lethal amounts of each of the drugs can cause death by their total impact. This *acute* effect occurs because the amount of enzyme available to degrade all of the related drugs is insufficient to deal with large amounts of both, and their combined toxic effects can be lethal. This occurs despite the fact that larger than baseline amounts of the metabolism enzyme have been induced by prior exposure to these drugs.

Cross tolerance also has a therapeutic implication. It means that, in detoxifying an alcohol or barbiturate addict, any sedative, minor tranquilizer, or even alcohol could be used for the gradual elimination of these depressant drugs. Alcohol- and sedative-dependent people have learned that when their preferred drug happens to be in short supply, one of the other depressant drugs will avoid the depressant withdrawal syndrome (the delirium tremens) that can develop when a person who has become tolerant to these substances suddenly stops their use. This procedure also applies to the use of methadone to maintain heroin-dependent persons. This is called cross dependence—the ability of drugs of the same or related classes to suppress the abstinence syndrome. Since a narcotic like heroin is only distantly related to the sedative/minor tranquilizer/anesthetic group, heroin addicts prefer to search out codeine cough syrup, methadone, or some other narcotic when heroin becomes unavailable. These users will, nevertheless, take alcohol or sleeping pills to partially reduce the severity of their withdrawal symptoms.

The following list mentions additional possible hazards of multiple drug use (Gross et al. 1973):

- The addition or potentiation of depressant effects on the respiratory and cardiac regulatory centers in the brain may cause overdose and death;
- When all drugs are simultaneously discontinued, multiple withdrawal syndromes may emerge;
- Alcohol combined with intravenously injected drugs may create increased organ pathology, particularly of the liver;
- Increased perceptual and cognitive dysfunction may occur;
- There is an increased likelihood of behavioral problems;
- As indicated by clinical experience, polydrug abuse tends to be more refractory to treatment than monodrug abuse.

The amount of brain dysfunction among polydrug-using individuals is a matter of some concern. In a collaborative study of five psychiatric centers, Grant et al. (1977) examined 151 polydrug users, 66 psychiatric patients, and 59 nonpatient subjects. The Halstead-Reitan Neuropsychological Test Battery, the MMPI, the WAIS, and an extensive drug use/medical history were obtained. Acute intoxication was ruled out by clinical observation and a urine drug screen. The results indicated that 37 percent of the polydrug group, 26 percent of the psychiatric patients, and 8 percent of the nonpatient controls were neuropsychologically impaired. On reexamination 3 months later, with diminished drug/alcohol usage, a quarter of the polydrug users had improved their Halstead-Reitan scores, indicating that a certain degree of reversibility of the mental deficits can occur in some instances.

Alcohol, the barbiturates, and certain other abused substances interfere with the therapeutic activity of many other classes of drugs. These interactions will not be considered here except to say that people on anticonvulsants, antibiotics, antidiabetic compounds, or anticoagulants should not drink or use barbiturates without their doctor's approval. The very popular combination of alcohol and aspirin is capable of causing gastric bleeding because both are irritating to the stomach lining, and aspirin interferes with clotting. The use of large amounts of alcohol together with acetaminophin (Tylenol) has been recently found to be hepatoxic. There are also drugs such as disulfiram (Antabuse), metronidazole (Flagyl), and certain agents used for the treatment of diabetes that so interfere with the metabolism of alcohol that they induce an uncomfortable reaction—consisting of a severe flush, chest pain, a drop in blood pressure, and other symptoms. The alcohol-Antabuse reaction is used as a deterrent therapy for certain patients with alcohol problems.

BIOBEHAVIORAL EFFECTS OF ALCOHOL/DRUG COMBINATIONS

Alcohol/Narcotic Combinations

Although ethanol and opiates do not potentiate each other, the combination of alcohol and heroin is a frequent cause of death (Eerola and Alha 1963); they do have an additive effect. Moller (1953) reported that a blood alcohol concentration (BAC) of 0.18 to 0.2 percent (definitely intoxicated) plus as little as 15 to 30 mg of morphine (an average dose) was fatal to nontolerant individuals. Similarly, patients on methadone maintenance who become secondarily addicted to alcohol have a mortality rate 10 times that of maintenance patients not overinvolved with alcohol (Roizen 1969). Baden (1972) stated that combined narcotism and alcoholism was the cause of death for 10 percent of Manhattan heroin addicts who died between 1950 and 1961; more than 20 percent of these heroin addicts were found to have histories of autopsy findings of chronic alcoholism.

Another New York autopsy report (Haberman and Baden 1974) reported that 30 percent of subjects assessed as opiate addicts were also alcoholics and that 16 percent of the assessed alcoholics were also opiate addicts. The doubly addicted individuals resembled those addicted only to alcohol in that they had more hospitalizations for illness during the year before their demise. Demographically, and as victims of homicide, they were similar to those addicted to narcotics only.

Doubly addicted persons are particularly vulnerable to liver disease; they sustain the toxic effects of alcohol on the liver that progresses from fatty infiltration to alcoholic hepatitis and finally to cirrhosis. Overlaid upon this damage is the viral hepatitis that is introduced through unsterile injections. The debilitating nutritional deficiencies common to the addicted add to the hepatic insufficiency. The reasons for the nutritional deficits can be summarized as follows: (1) poor intake of essential nutrients because of anorexia, vomiting, and the spending of available funds on alcoholic beverages; (2) poor assimilation of essential nutrients due to inflammatory changes in the gastrointestinal tract and diarrhea; (3) increased utilization of certain vitamins in the metabolism of alcohol; and (4) increased loss of iron from hemorrhage.

Little has been written on the abuse of alcohol among patients on narcotic antagonists. Now that long-acting narcotic antagonists are being used on a wider scale, it might be predicted that those whose enjoyment of opiates has been blocked will turn to drink, and this may become a major problem when treatment employs naltrexone or other antagonists.

Experimental studies of human behavior utilizing narcotics aside from methadone and alcohol have not been found. This is understandable in view of ethical restrictions on administering the potentially dangerous combination of opiates plus alcohol to those who have never been addicted or to ex-addicts.

Propoxyphene (Darvon) is a commonly used analgesic with properties reminiscent of narcotics. In fact, its chemical structure resembles methadone. It has been known to be abused alone and in conjunction with alcohol. An average dose, 65 mg, was given to normal subjects along with a modest amount of alcohol (to effect a BAC of 0.05 percent) along with matching placebos (Kiplinger et al. 1974). Each drug alone produced slight impairment on pursuit meter performance, standing stability, and verbal tests. The combination resulted in an addictive effect that moderately impaired the subjects' test results.

Alcohol/Sedative Combinations

Combinations of alcohol and barbiturates are supra-additive because both chemicals compete for similar enzyme systems in order to complete their metabolic degradation. Milner (1970) and Guptka and Kaford (1966) reported that a BAC of 0.1 percent (the commonly accepted level of evidence of intoxication) and a blood barbiturate reading of 0.5 percent (a third as high as the lethal level) had been fatal. Death occurs in such cases because barbiturate metabolism is inhibited and the presence of the sedative in the organism is prolonged, producing coma and respiratory arrest at doses of each drug that ordinarily would not be fatal. This potentiation of alcohol and barbiturates holds only for the nontolerant person or for the chronic user of alcohol who is actively drinking. When an alcoholic stops drinking, the liver enzymes become available for barbiturate breakdown. In fact, because of long-term drinking, enzyme induction will have been stimulated, and barbiturates and certain other drugs are metabolized even more rapidly than usual; thus, a relative resistance to these drugs will occur. This phenomenon accounts for the difficulties in anesthetizing or sedating alcoholics who have recently stopped drinking when entering a hospital for surgery or detoxification from alcohol.

When the liver has been so extensively damaged from prolonged excessive drinking that it is unable to manufacture the metabolizing enzymes, alcohol and other abused substances are degraded inefficiently, and even small amounts recirculate and may cause severe intoxication.

Other depressant drugs that are potentiated by alcohol include paraldehyde, chloral hydrate, ether, and chloroform. One life-threatening combination is that of alcohol with carbon tetrachloride, a volatile solvent that was used until recently as a dry cleaner. Alcohol increases the solubility of carbon tetrachloride, which is highly toxic to the liver and kidneys.

Another substance requires special mention. Methaqualone (Quaalude) in combination with alcohol has been described by Inaba et al. (1973) as occasionally producing stupor, coma, and respiratory depression. This reaction to the combination was known by its abusers as "luding out"—i.e., passing out. Although similar effects have been known with chloral-alcohol combinations (these are the reputed "knockout drops"), methaqualone-alcohol usage became increasingly popular until recently when methaqualone was placed in a more restrictive legal classification.

Sedatives and alcohol, sharing the same class, have many pharmacologic properties in common. They both produce tolerance and cross tolerance; the withdrawal syndrome is identical (DTs, the delirium tremens); they compete for similar enzyme systems in the liver; and they potentiate each other's effects. Many hypnosedative addicts abuse alcohol and vice versa, and the various patterns of abuse are similar: acute intoxication, binge usage, and continuous consumption of large amounts. It would be difficult to distinguish intoxication with barbiturates from alcohol except for the odor that accompanies the latter. Further, the use of both may be more common than is frequently realized. According to Devenyi and Wilson (1971), various studies indicate that 22 to 70 percent of certain alcoholic populations abuse barbiturates as shown by urine analyses.

Sedatives and alcohol are not infrequently taken together for suicidal purposes. DAWN IV data revealed that of 23,148 mentions of alcohol in combination, 32 percent were suicide attempts or gestures, 30 percent were used for the psychic effects, 13 percent were consumed to maintain a state of dependence, and the remainder either gave no response or the motives were unknown (National Institute on Drug Abuse 1976).

The combined effect of hypnosedatives and ethanol markedly worsens mental and motor performance. Loomis (1963) demonstrated this in a driving simulator with secobarbital (Seconal), and alcohol. Phenobarbital can dramatically decrease reaction time in conjunction with alcohol intake. Increased drowsiness and impaired motor function may persist for as long as 24 hours following the use of the combined drugs (Doenicke and Kugler 1965).

The same deterioration of psychophysiological functioning occurs with chloral/ethanol combinations. Sellers et al. (1972) reported both substantial physiologic alterations and prolonged reaction time, impaired tracking and vigilance decrements. Glutethimide (Doriden) and alcohol likewise have been shown to impair reaction times and other behavioral tasks more than either drug alone (Mould et al. 1972).

Alcohol/Minor Tranquilizer Combinations

A large number of studies have proven that benzodiazepines like chlordiazepoxide (Librium) and diazepam (Valium) do not potentiate alcohol (Votarova and Dyntarova 1970; Vaapatala and Karppanen 1969; Bowes 1960; and Miller et al. 1963). Bernstein et al. (1967) could not even find an additive effect for diazepam and alcohol. There were no adverse drug interactions and no tolerance development. In fact, the benzodiazepines were considered preferred drugs for the acute treatment of the alcoholic patient. More recently, however, it has been found that large doses of the benzodiazepines do have an additive effect (in contrast to a potentiating effect) upon alcohol, and alcoholics given these agents over long periods during unsupervised treatment have taken them in increasing quantities (Hollister 1977). An occasional fatality has been recorded when large amounts of these minor tranquilizers have been consumed with significant amounts of alcohol. Although the metabolism of the benzodiazepines is not disturbed by alcohol, the additive effect results from the CNS depressant activity of both drugs. Diazepam blood levels were higher when alcohol was consumed with the drug than when diazepam was used alone. A similar increase in blood levels was not found with a chlordiazepoxide/alcohol combination (Linnoila and Mattila 1973).

The benzodiazepines are the most widely prescribed of all drugs; diazepam ranks first on national prescription audits. Bo et al. (1975) compared 74 auto drivers who had been hospitalized following accidents with a control group of 204 motorists who had not been in an accident. Testing revealed that 41.8 percent of those hospitalized retained alcohol in their blood, while only 1.5 percent of controls did so. Diazepam was in the blood of 9.5 percent of the injured drivers, compared with 2.0 percent in the control group. Of the accident group, a total of 10.8 percent had consumed both alcohol and diazepam before driving, while none of the control group had this combination on testing. This study demonstrated that the increased public intake of diazepam and its use concurrent with alcohol may significantly contribute to traffic accidents.

When low doses of a benzodiazepine are taken along with a small amount of alcohol, little or no impairment of functioning is detectable. It is in the higher dosage ranges that behavioral deficits become obvious. Hughes and Forney (1965) found no impairment on a pursuit tracking test or on a subjective symptom questionnaire after chloridazepoxide and alcohol. Nor could Miller et al. (1963) or Bowes (1960) detect any change on physiologic measures or on a digit symbol task. The administration of 5 mg of diazepam three times daily plus 3 ounces of 100-proof vodka did not impair subject performance on simple psychomotor tests (Lawton and Cann 1963).

The majority of experimental studies do report decrements in various complex behavioral activities under combined benzodiazepine/alcohol use. Palva et al. (1976) demonstrated that chlordiazepoxide plus alcohol impaired short-term memory and learning. Performance deficits in eye control and standing steadiness were noted by Goldberg (1963) from an alcohol/chlordiazepoxide combination. Burford et al. (1975) found that diazepam plus alcohol produced a more prolonged reaction time than did alcohol alone; their subjects were unaware of their impairment. In a driving test, Smiley et al. (1975) recorded a decreased ability of subjects on diazepam and alcohol to stop accurately. Subjects' wheel movements while under the influence of these substances were also different from normal wheel handling patterns. Franks et al. (1975) and Molander and Duvok (1976) used an extensive battery of sensory, perceptual, and psychomotor tasks and detected increased deficits with benzodiazepine/alcohol combinations. Only the mood and subjective judgment of their test groups' condition was unchanged.

Five to 10 mg of diazepam plus either 0.5 or 0.8 gram/kg of alcohol, plus appropriate placebos, were given to subjects who were tested with a complex reaction time test and tracking in a driving simulator. The subjects provided a rating of their performance (Linnoila and Mattila 1973). Although the single drugs improved scores slightly, the combinations impaired performance. Moskowitz and Burns (1977) gave their subjects 5 mg of diazepam plus enough alcohol to obtain a BAC of 0.07 percent. In tests of tracking, visual search, information processing, and eye movement efficiency, the combination significantly impaired performance (these are psychomotor activities important in driving or operating machinery). Tested skills were performed less well under divided attention situations; this situation is also characteristic of driving behavior. On complex tasks like mirror tracking, time estimation, sorting, and letter cancellation, the drug combination resulted in definite impairment (Moreland et al. 1974). In assessing these studies, it should be remembered that the experimental benzodiazepine doses did not approach those ordinarily used by abusers of these drugs. Therefore, it would be expected that more serious deterioration of performance would occur among multiple drug abusers.

There seems to be little question that meprobamate/alcoholcombinations worsen an array of psychomotor behaviors. Among other functions, oculomotor control, body steadiness, and fatigue (Goldberg 1963); reaction time and tracking (Loomis 1963); simple arithmetic, visual illusion, and other psychophysiologic tests (Zirkle 1960); and time estimation, attention span, and alertness (Reisby and Thielgaard 1968) all showed significant decrements. Meprobamate seems to have additive action when combined with alcohol as demonstrated with various performance tasks by Zirkle et al. (1960), Munkelt et al. (1962), and Goldberg (1970).

Alcohol/Marijuana Combinations

Marijuana and its active ingredient, delta-9-tetrahydrocannabinol (THC) have a sedative quality, and when used with alcohol, an additional sedative effect is noted. Both alcohol and marijuana increase the pulse rate, and summative effects upon heart rate have also been found. Whether cross tolerance develops has not yet been clearly established.

The combination of cannabis and alcohol is a popular one, with the alcohol ordinarily being consumed in the form of sweet wines or beer. It is believed that some of the combined use is due to the relative lack of potency of the cannabis used in this country; the alcoholic beverage assumes the role of booster or enhancer of the effect of the marijuana.

There is a general agreement that alcohol/marijuana combinations produce an additive decrement on various behavioral tasks. Chesher et al. (1976) indicated that standing steadiness, manual dexterity, and psychomotor skills were more impaired with the combined drugs than with either alone. Increased deficits in monitoring visual signals during a divided attention task were observed by Macavoy and Marks (1975). Moskowitz (1976) also demonstrated impaired vigilance, information processing, and oculomotor control. An additive effect on pursuit tracking patterns, mental arithmetic, and heart rate when cannabis and alcohol were combined was found by Manno et al. (1971).

The mean tracking error score for a complex tracking task was higher for the combination of a low dose of THC (0.21 mg/kg) plus a low dose of alcohol (0.03 percent BAC) than for either a high dose of THC (0.88 mg/kg) or a higher dose of alcohol. The combination also caused greater pulse rate acceleration and conjunctival injection than either drug alone (Hanstein et al. 1976).

Alcohol/Stimulant Combinations

Although amphetamines and alcohol are physiologic antagonists, only the depressant effects of alcohol are neutralized. When alcohol produces excitability, amphetamines will increase that excitability (Weiss and Laties 1964). Seevers (1963) found that alcohol-inebriated patients given amphetamines became overactive and more difficult to deal with.

Methylphenidate (Ritalin), an occasionally abused stimulant, is also a pharmacologic antagonist to alcohol; in fact, it has been used in the treatment of alcoholic coma (Horvath 1963). However, behaviorally it can have a synergistic effect by increasing alcohol-induced hostility and paranoia.

In an early study, Bruns (1941) found that amphetamines counteracted the alcohol-induced impairment of psychomotor skills. Newman and Newman (1956) could not completely confirm this. More recent investigations on pursuit tracking (Brown et al. 1966), mental performance tasks (Kaplan et al. 1966), and overall mental functioning (Hughes et al. 1965) also report a lack of improvement when amphetamines are added to alcohol; in fact, there was a further decrement. Wilson et al. (1966) used a complex battery of test situations and found that amphetamines did reverse the ethanol deficit on some mental performance tests but not on psychomotor skills, indicating that a very complicated interaction was taking place. It appears that the ability of a stimulant to counteract the decremental effects of alcohol is a function of task complexity. Simple tasks may be done better; difficult ones, worse.

Risk taking in the form of gambling, verbal productivity, and mood were examined under the influence of 45 grams of alcohol (approximately three drinks), of 15 mg of dextroamphetamine, and of both substances combined (Hurst et al. 1969). Confidence, garrulousness, and mood elevation occurred with both drugs and also with the combination.

Kipperman and Fine (1974) analyzed their group of amphetamine and alcohol abusers and found that they could be sorted into two types. Type A were older (28 to 45 years) and were long-term, primary alcoholics who also took amphetamines in order to remain awake and be able to drink more. Type B were younger (19 to 27 years) and were primary amphetamine abusers who used small amounts of alcohol to "level off" an amphetamine "run." After stopping their amphetamine spree, this group consumed large amounts of ethanol in order to fall asleep. Type A members described a loss of inhibition, greater sociability, and increased self-esteem and euphoria on the combination. Type B individuals mentioned greater sensitivity, clearer thinking, and a lifting of depression. The alcohol made them more sociable. When sober, both groups were antisocial, were unable to hold jobs for long periods, had a record of truancy and disrupted family relationships, and had served time in jail. Both groups were moderately depressed and anxious and seemed to be treating their depression with their abused drugs. A better treatment of their depression was seen as a potential therapeutic approach.

Since strong black coffee is widely employed as a sobering-up device, it would be worth knowing whether caffeine actually does improve alertness and functioning of the intoxicated person. The conclusions of research are ambiguous. At times improvement occurred; at others there was a worsening of performance (Nash 1966; Alstatt and Forney 1971).

Frank et al. (1975) found that people with a BAC of 0.09 percent were uninfluenced by 300 mg of caffeine (equivalent to about three cups of coffee). Standing steadiness with eyes closed, manual dexterity, numerical reasoning, perceptual speed, and verbal fluency were performed worse with the ethanol-caffeine combination. Reaction times were better after caffeine. No clear pattern of caffeine antagonizing the effects of alcohol could be observed; the BAC was unaffected by caffeine. The authors speculated that drinking drivers might feel more alert after caffeine and believe themselves to be recovered from their intoxication. Nevertheless, such drivers would remain handicapped in motor coordination and in search and recognition procedures.

Alcohol/Antidepressants

The tricyclic antidepressants, somewhat paradoxically, are not stimulants. Instead, some have a sedative quality and for that reason are occasionally abused. They are also being used as suicide devices since they can induce major abnormalities of heart rhythm when swallowed in large amounts.

Amitriptyline (Elavil) given the evening before and prior to the testing in therapeutic doses was combined with enough alcohol to produce a 0.08 percent BAC. Placebos were also used. The combination increased the error score during simulated driving, pursuit rotor, and dot tracking. Even in ordinary doses the interaction can be hazardous (Landauer et al. 1969). Seppola et al. (1975) administered either amitriptyline or doxepin (Sinequan) in combination with alcohol in 0.5 gm/kg quantities. The combinations produced slight impairment of choice reaction time, coordination tests, attention, and tracking tasks. The subjects' assessment confirmed that they were impaired. These changes occurred despite the fact that the antidepressants were given for 10 days prior to the test day; the expectation would be that tolerance to any sedative effect would have occurred.

Alcohol/Antihistamine Combinations

Many antihistamines such as diphenhydramine (Benadryl), chlorpheniramine (Chlor-Trimeton), and others produce drowsiness in many people. For that reason these substances appear in over-the-counter sleeping preparations, which are known to be occasionally abused. When combined with alcoholic beverages, the sedative effects of both are additive. Linnoila (1973) detected a significant worsening of coordination when diphenhydramine/alcohol mixtures were ingested. Pursuit tracking was impaired with a similar combination (Hughes and Forney 1964).

Alcohol/Nicotine Combinations

In view of recent work suggesting that smoking alcoholics have cancers of the head, neck, and esophagus more frequently than nonsmoking alcoholics or nonalcoholic smokers, the cigarette/alcohol relationship has become a public health issue (Alcohol and Health 1976). The basis for the increased incidence of these malignancies is ethyl alcohol's ability to increase the solubility and absorption of coal tars from tobacco. Elber (1939) and Lickint (1957) have evidence that the combination worsens dexterity and mentation.

Heavy drinkers also tend to be heavy smokers (Simon and Lucero 1960), although just why these patterns should coexist is not clear. Nicotine does not reverse the undesired effects of excessive alcohol consumption, and certainly not alcohol-impaired performance (Macht and Davis 1934). It may be that the desirable effect occurs on a subjective level, or that both heavy smoking and drinking are strongly conditioned behaviors.

PATTERNS OF MULTIPLE DRUG ABUSE

In order to provide some empirical perspective on the discussion of effects of combined drug/alcohol use, two studies that allow for an in-depth examination of multiple substance usage will be discussed in this section.

The National Drug/Alcohol Collaborative Project obtained significant data pertaining to multiple

TABLE 1.—*The number and percentage of regular drug users of each drug category who reported altering the effects of that drug*

Regular drug users	Alcohol	Heroin	Other opiates	Amphetamines	Barbiturates	Minor tranquilizers	Marijuana/ hashish	Illicit methadone	Cocaine	Hallucinogens	Inhalants	OTC	Anti-Depressants	Major Tranquilizers
Altered:														
n	497	320	130	234	161	149	501	97	223	205	56	37	36	21
Percent	53	71	66	72	76	55	76	72	77	72	36	54	80	57
Did not alter:														
n	434	132	66	92	51	124	154	37	67	80	101	32	9	16
Percent	47	29	34	28	24	45	24	28	23	28	64	46	20	43

Source: NDACP Final Report, 1977 (National Institute on Drug Abuse, 1980).

drug abuse. It should be noted that the NDACP sample of patients in treatment was neither random nor representative, and that information was derived from self-reports. Table 1 gives the numbers of regular users of 14 different substances who altered (boosted, balanced, counteracted, or sustained) the effects of their primary drug. Table 2 lists the major substance used to alter the effects of the primary drug. Table 3 gives the number of regular users of a drug who reported that they substituted another drug when the primary drug was not available. Table 4 gives the drug which was most commonly employed as a substitute when the primary drug could not be obtained.

From these and other patient-derived data, the following results of interest to this chapter were obtained. It should be pointed out that the analyses of substance abuse patterns were conducted for two time frames: the 3 months previous to admission and the entire drug-using career previous to admission.

1. NDACP subjects were primary multiple substance abusers.
2. Alcohol was the substance abused most often by both single and multiple drug abusers.
3. The greatest number of subjects classified as career multiple substance abusers had used alcohol and only one other substance per the NDACP study (National Institute on Drug Abuse 1980). In descending order of frequency, the other drugs were marijuana/hashish ($n = 159$); minor tranquilizers ($n = 75$); heroin ($n = 19$); amphetamines ($n = 14$); and barbiturates ($n = 10$).
4. The majority of subjects in every substance abuse category (except inhalants) reported using one or more drugs to alter the substances already taken; more than 75 percent of the regular users of barbiturates, marijuana, cocaine and antidepressants reported such use. The two drugs most commonly used for this purpose were alcohol and marijuana.
5. The two drugs that were most frequently substituted for were heroin and illegal methadone. Alcohol and inhalants least frequently required substitute drugs. Alcohol and mari-

TABLE 2.—*The single substance most commonly used to alter each other substance*

Initial substance	Substance used to alter effects of initial substance
Alcohol	Marijuana
Heroin	Cocaine and marijuana
Other opiates	Alcohol
Amphetamines	Alcohol
Barbiturates	Alcohol
Minor tranquilizers	Alcohol
Marijuana/hashish	Alcohol
Illegal methadone	Heroin and alcohol
Cocaine	Heroin
Hallucinogens	Marijuana

Source: NDACP Final Report, 1977 (National Institute on Drug Abuse, 1980).

TABLE 4.—*Most commonly reported substitute for each substance*

Initial substance	Substitute
Alcohol	Marijuana
Heroin	Other opiates
Other opiates	Heroin
Amphetamines	Marijuana
Barbiturates	Minor tranquilizers, marijuana, alcohol
Minor tranquilizers	Alcohol
Marijuana/hashish	Alcohol
Illegal methadone	Heroin
Cocaine	Heroin
Hallucinogens	Marijuana

Source: NDACP Final Report, 1977 (National Institute on Drug Abuse, 1980).

TABLE 3.—*Number and percent of regular users of a drug who reported substituting other drugs for it*

Regular drug users	Alcohol	Heroin	Other opiates	Amphetamines	Barbituates	Minor tranquilizers	Marijuana/ hashish	Illicit methadone	Cocaine	Hallucinogens	Inhalants
Substituted:											
n	299	269	92	119	115	112	294	92	138	112	45
Percent	31	58	48	37	48	32	44	69	48	39	29
Did not substitute:											
n	675	189	101	205	123	163	372	41	151	174	109
Percent	69	42	52	63	52	68	56	31	52	61	71

Source: NDACP Final Report, 1977 (National Institute on Drug Abuse, 1980).

juana were the drugs most frequently used as substitutes.

6. The greatest amount of alcohol consumed was reported by those who had abused seven or more substances at some time during their substance abuse careers.
7. The career alcohol/other opiate abusers had the highest alcohol consumption followed by alcohol/minor tranquilizers, alcohol/marijuana and alcohol/heroin.
8. Those who abused alcohol and marijuana concurrently reported smoking more marijuana than those using marijuana alone.
9. The greatest number of adverse effects from alcohol were reported by the users of alcohol/amphetamines followed by the alcohol/minor tranquilizer and the alcohol/barbiturate groups.

Multiple Drug Use in Clients Attending Alcohol Treatment Facilities

A second large multicenter study (Tuckfeld et al. 1975) was undertaken in an effort to determine drug usage trends in clients attending alcohol treatment facilities. The investigators interviewed the service deliverers in six representative clinics. A widespread use of drugs, primarily nonopiates, was reported, and the service deliverers mentioned the following trends:

1. Persons under 25 were increasingly using alcohol either in combination with other drugs or when illicit drugs were inaccessible. Marijuana use was reported as a norm for this age group.
2. For persons under 30 who used drugs, males outnumbered females 3 to 1. Besides alcohol, the drugs most often reported were marijuana and the other psychotropic drugs. Barbiturates and amphetamines were also commonly used, although barbiturate use was reported to be on the decline. Hallucinogens are used more frequently by this age group than by the over-30 group.
3. Females over 30 years of age primarily abused minor tranquilizers and other psychotropics. This was particularly pronounced for subjects from middle- and upper-class households. Males over 30 were reported as primarily using psychotropics, and at one data collection site amphetamines were extensively used.
4. The particular substance used was more likely to be a function of drug accessibility and subcultural norms than of socioeconomic status or racial/ethnic group. Persons of lower socioeconomic status, however, rarely tended to use drugs other than alcohol unless they had recently visited a free clinic or public hospital. The drugs primarily used were psychotropics.
5. Consumption patterns were either conjoint or sequential. Conjoint use characterized persons who consumed drugs other than alcohol for recreational purposes. Sequential use generally was associated with attempts to improve daily social functioning or to cope with sobriety until a return to alcohol. Over-the-counter drugs were used primarily for self-medication.
6. It was estimated that 30 to 60 percent of all clients at alcoholism treatment facilities were using other substances at intake. Of these, half were abusing such drugs (abuse was defined as the nonmedical use of prescription drugs or the use of illicit drugs).
7. Persons under 30 were believed to have the highest incidence of multiple drug use. Females had a higher rate of multiple drug use than males.
8. Public inebriates were reported to have a lower rate of illicit multiple drug use than did populations from higher socioeconomic levels.

PSYCHOSOCIAL EFFECTS OF ALCOHOL/DRUG COMBINATIONS

Drug combination effects upon human behavioral patterns have been explored only recently; however, there are certain investigations which have special importance for this chapter. These will be discussed according to specific behaviors and their modification by alcohol combined with other substances.

Alcohol/Drug Effects on Sexuality and Violence

Shakespeare's comment in Macbeth citing the negative impact that drinking has upon the sexual response remains valid; in fact, it is being confirmed by recent investigations. Gebhard (1965) suggests that small amounts of alcohol or related drugs may initiate sexual activity by lessening inhibitions and producing euphoria. The recent finding that chronic drinkers have an elevated level of luteinizing hormone may also help explain the increased sexual arousal. However, larger amounts of the same depressant substances tend to decrease sexual ability. Recent work has demonstrated that chronic heavy drinkers have a decreased plasma testosterone level, which may contribute to impotence. There are few experimental studies on the impact of alcohol on sexual arousal and no investigations of alcohol conjointly administered with another drug in the area of sexuality.

The well-known propensity of alcohol for unleashing aggressive verbal and physical behavior is paralleled by the sedatives because of their similar disinhibiting properties. In a commentary on drugs and crime, Tinklenberg (1973) notes that intradrug interactions have exceedingly complex behavioral effects, and that combinations have not been investigated in regard to their ability to induce violence. It may well be that the social and cultural contexts in which psychochemicals are used tend to determine their aggressive component.

Alcohol's direct relation to violence and violent crime is considered far greater than that of any other drug. Fitzpatrick (1974) has found that alcohol/barbiturate combinations also produce high levels of assaultive behavior.

Information obtained in the NDACP study (National Institute on Drug Abuse 1980) provides further data on the role of both alcohol and drugs in violent acting out. In answer to the question, "Have you ever gotten angry or violent and *seriously injured* someone while under the influence of drugs, alcohol, or both?" 39 percent of the regular alcohol users indicated that they had done so. Comparable confirming percentages for heroin users were 42 percent; for amphetamine users, 45 percent; users of barbiturates, 55 percent; and users of marijuana, 46 percent. Of those respondents who had been in automobile accidents, the following percentages had used drugs and/or alcohol immediately prior to the experience: heroin users, 36 percent; amphetamine users, 43 percent; users of barbiturates, 35 percent; users of marijuana, 36 percent; and alcohol users, 38 percent.

Alcohol Use and Drug-Taking Behavior

The DARP (Drug Abuse Reporting Program) data for patients who had been in Federal drug treatment programs showed that 23 percent drink the equivalent of more than 8 ounces of 80-proof liquor daily (Simpson and Lloyd 1977). Day-to-day variations on this average were related to negative and positive life experiences. Fifteen percent drank less and 22 percent drank more when illicit drugs were used. Among the heavier drinkers the mean use of opioids, nonopioids and marijuana decreased while drinking, with less opioid use being statistically significant ($p = 0.001$). When less alcohol was consumed by these ex-patients, the means for all illicit drug use increased; however, only opioid use increased significantly ($p = 0.03$). For these people alcohol seemed to be acting as a substitute for illicit drug use, particularly opioids. Life stress situations and the persuasion of friends accounted for some of the variance. Alcohol consumption was less for patients in treatment than for those no longer in treatment. It was pointed out that excessive alcohol use sometimes predated the drug abuse. Drinking tended to decrease when opiate use started. Those who were heavy drinkers before their opiate dependence tended to continue that behavior while on methadone maintenance.

Suicide and Alcohol/Drug Combinations

The DAWN IV data (May 1975 to April 1976) have already been mentioned (National Institute on Drug Abuse 1976). This report indicated that suicidal attempts or gestures were the leading reason that patients who had taken alcohol in combination with other drugs appeared at crisis centers, emergency rooms, or the morgue. Of 23,148 mentions of those using alcohol-in-combination, 32 percent were suicide attempts/gestures. Another 30 percent had consumed the substances for the psychic effects involved. Thirteen percent had used the combination to maintain their dependence, and the remainder gave no response.

For purposes of suicide the intake of alcohol with other depressants is pharmacologically rational since the combination produces additive or potentiating effects. Then, too, depressive tendencies in substance users may be related to such gestures: Chronic alcoholics are more prone to attempt suicide than nonalcoholics (Goodwin 1973). Further, about one-quarter of suicides are committed by alcoholics.

The NDACP data (National Institute on Drug Abuse 1980) address these relationships. Two-thirds of those who initiated suicide attempts were under the influence of a psychotropic drug at the time. More than half used a psychochemical or a drug combination in the attempt to end their lives. About a quarter used barbiturates, some 15 percent used alcohol, and the agents used by the rest were distributed among many other drugs or drug combinations.

Alcohol/Depressant Combinations and Sleep

Acute alcohol intoxication is known to distort normal sleep patterns. Rapid eye movement (REM) sleep is diminished, particularly during the first half of the night, while slow wave sleep is increased (sleeping pills have a similar effect upon the sleep EEG). Chronic alcoholism can also be associated with extreme sleep disturbances, with a considerable REM deficit occurring. When the amount consumed decreases or is eliminated, an REM rebound with accompanying nightmares develops, resulting in fragmented sleep patterns and insomnia. At times transitional states occur in which the individual cannot identify whether s/he is having nightmares or is awake and hallucinating. During withdrawal REM sleep may increase, consuming up to 100 percent of sleep time (Gross et al. 1973). The hypnosedatives, the minor tranquilizers, and related drug groups do not improve this sleep disturbance of the alcoholic; in fact, combined alcohol/sedative dependencies produce similar sleep disturbances.

Alcohol is often used by alcoholics and nonalcoholics to procure sleep. A dramatic impairment of sleep, on the other hand, occurs early in the withdrawal phase when people verging on the DTs are afraid to close their eyes because they start hallucinating.

Gross and Hastey (1976) describe the sleeplessness that accompanies the alcohol withdrawal state as consisting, in part, of an intense fear of not sleeping that approaches insomnophobia. Alcoholics so affected may try to drink themselves to sleep or to swallow whatever sleeping medication is at hand, or both.

Subjective Effects Reported by Alcohol and Drug Users

The NDACP questionnaire (National Institute on Drug Abuse 1980) inquired into the subjective effects of alcohol and of specific drugs in those people who were users of alcohol and/or drugs. The questions asked covered 37 areas of emotional and behavioral changes under the influence of either alcohol or the other substance. The most common combinations in the sample were: alcohol and heroin, alcohol and other opiates, alcohol and barbiturates, alcohol and minor tranquilizers, alcohol and marijuana, and alcohol and amphetamines.

When compared to all other categories, alcohol was named as a confusion-causing agent more frequently than any other substance. According to the respondents, alcohol also produced much more anger and fewer feelings of peace; caused a greater loss of control; and was less effective in awareness in comparison to other agents.

CONCLUSION

In reviewing the empirical evidence, it can be concluded that joint substance abuse is of considerable significance. Such usage may relate to ignorance of the pharmacologic facts, as with the combination of amphetamines or mild antidepressants with social drinking. Other cases may involve the addict who consciously combines intoxicating levels of ethanol and large amounts of psychoactive drugs. While the social "misuser" of substances may suffer impairment of abilities related to normal functioning and/or driving, the chronic abuser may pose a considerable risk to himself and to others. Though experimental studies concerning the latter subject are understandably lacking, clinical and autopsy reports serve to underscore the hazardous nature of unmoderated alcohol/drug use.

The biobehavioral evidence surveyed in this chapter indicates that almost all classes of drugs have additive or supra-additive effects when combined with alcohol. Even the stimulants can increase the excitable phase of drinking and may intensify paranoid ideation. Studies attempting to show that stimulants reverse the psychomotor decrements of the alcohol-intoxicated person have not been conclusive. Therefore, efforts to treat intoxication with stimulants may result in unanticipated consequences.

Another point that should be reemphasized is the biphasic nature of certain drug/alcohol interactions. Acute alcohol intake along with sedative consumption can lead to the potentiation of depressant effects. On the other hand, the chronic alcoholic who stops drinking is more resistant to sedatives, and this is common hospital experience in attempting to quiet patients during alcohol withdrawal.

The impact of most drugs when combined with alcohol is to increase dysfunctional and antisocial behaviors. Research indicates that impaired sexual functioning, disinhibition of aggressive behavior, suicide attempts/gestures, and sleep disturbances result from conjoint substance abuse. These findings are supplementd by the subjective testimony of addicts in treatment who report increased anger and loss of control/self-awareness under the influence of alcohol. Data bases such as the DARP, which suggests that increased alcohol intake is often associated with decreased drug intake following treatment, are of special interest to clinic personnel concerned with these problem behaviors.

The National Institute on Alcohol Abuse and Alcoholism has prepared a prototype prescription form that can be given to those having difficulty abstaining from drinking; it mentions that many unwished-for interactions can occur when certain therapeutic drugs are mixed with alcoholic drinks. In view of the bio- and socio- behavioral problems described in this chapter, it would seem that pharmacists, physicians, and clinic personnel should be prepared to similarly advise their clients/patients on the possible ill effects of combined substance use. More importantly, they should stress that the combination of two or more mind-altering agents produces not only successively greater impairments, but also tends to increase unpredictability. Hopefully, future research will address present gaps in current knowledge—and serve to focus public attention on the problem as well.

REFERENCES

Alcohol and Health. Second Special Report to the U.S. Congress. No. 77-9099. Washington, D.C.: U.S. Government Printing Office, 1976.

Alstatt, R. L., and Forney, R. B. Performance studies in rabbits, rats and mice after administration of l-methyl-xanthene, singly and with ethanol. *Federal Proceedings,* 30:568, 1971.

Baden, M. M. Homicide, suicide and accidental death in Manhattan. *Human Pathology,* 3:91-95, 1972.

Bernstein, M. E.; Hughes, F. W.; and Forney, R. B. The influence of a new chlordiazepoxide analogue on human and mental and motor performance. *Journal of Clinical Pharmacology,* 7:330-335, 1967.

Bo, O,; Haftner, J.F.W.; Langard, O.; Trumpy, J. H.; Bredesen, J. E.; and Lunde, P.K.M. Ethanol and diazepam as causative agents in road traffic accidents. In: Isrealstan, S., and Lambert, S., eds. *Alcohol Drugs and Traffic Safety.* Toronto: Addiction Research Foundation, 1975.

Bowes, H. A. The role of Librium in an outpatient psychiatric setting. *Diseases of the Nervous System,* 21:20-22, 1960.

Brown, D. J.; Hughes, F. W.; Forney, R. B.; and Richards, A. B. Effects of dextroamphetamine and alcohol on attentive motor performance in human subjects. In: Harger, R. H., ed. *Alcohol and Traffic Safety.* Bloomington: Indiana University Press, 1966.

Bruns, O. I. Pervitin: pharmacological and clinical aspects. II. Pervitin: the question of performance enhancement. *Fortschrifte der Therapie,* 17:37-44; 90-100, 1941.

Burford, E.; French, I. W.; and LeBlanc, A. E. The combined effects of alcohol and common psychoactive drugs. 1. Studies of human pursuit tracking capability. In: Isrealstam, S., and Lambert, S., eds. *Alcohol, Drugs and Traffic Safety.* Toronto: Addiction Research Foundation, 1975.

Chesher, G. B.; Franks, H. M.; Hensley, V. R.; Hensley, W. J.; Jackson, D. M.; Starmer, G. A.; and Teo, R.K.C. The interaction of ethanol and delta-9-tetrahydrocannabinol in man. Effects on perceptual, cognitive and motor functions. *Medical Journal of Australia,* 2:159-163, 1976.

Devenyi, P., and Wilson, M. Barbiturate abuse and addiction and their relationship to alcohol and alcoholism. *Canadian Medical Association Journal,* 215:215-218, 1971.

Doenicke, A., and Kugler, J. Investigations after barbiturate medication and additional ingestion of alcohol in the course of 24 hours: establishing the barbiturate level in the serum, tests of liver function and psychodiagnostic tests. *Aktuelle Probleme en der Chirurgie,* 2:134-148, 1965.

Eerola, R., and Alha, A. Synergism of alcohol and sedatives. *Deutsch Gerichtlichen Medizien,* 53:201-210, 1963.

Elbel, H. Demonstration of effects of caffeine on blood alcohol level and drunkenness. *Beitraege zur Gerichtlichen Medizien,* 15:14-25, 1939.

Fitzpatrick, J. P. Drugs, alcohol and violent crime. *Addictive Diseases,* 1:353-367, 1974.

Franks, H. M.; Starmer, G. A.; Chesher, G. B.; Jackson, D. M.; Hensley, V. R.; and Hensley, W. J. The interaction of alcohol and delta-9-tetrahydrocannabinol in man: effects of psychomotor skills related to driving. In: Israelstam, S. and Lambert, S., eds. *Alcohol Drugs and Traffic Safety.* Toronto: Addiction Research Foundation, 1975.

Gebhard, P. H. Situational factors in affecting human sexual behavior. In: Beach, F. A., ed. *Sex and Behavior.* New York: Wiley, 1965.

Goldberg, L. *Effects and aftereffects of alcohol, tranquilizers and fatigue on ocular phenomena.* In Harvard, J.D.J., ed. *Proceedings of the Third International Conference on Alcohol and Road Traffic.* London: British Medical Association House, 1963.

Goldberg, L. Effects of ethanol in the central nervous system. In: Popham, R. E., ed. *Alcohol and Alcoholism.* Toronto: University of Toronto Press, 1970.

Goodwin, D. W. Alcohol in suicides and homicides. *Quarterly Journal of Studies on Alcohol,* 34:144-156, 1973.

Grant, I.; Adams, M. K.; Carlin, A. S.; Rennick, P. M.; Judd, L. L.; and Schrooff, G. The collaborative neuropsychological study of polydrug users. *Archives of General Psychiatry,* 35:1063-1074, 1978.

Gross, M. M.; Lewis, E.; and Hastey, J. Acute alcohol withdrawal syndrome. In: Kissin, B., and Begleiter, H., eds. *The Biology of Alcoholism.* Vol III. New York: Plenum Press, 1973.

Gross, M. M., and Hastey, J. M. Sleep disturbances in alcoholism. In: Tarter, R. E.; and Sugarman, A. A., eds. *Alcoholism: Interdisciplinary Approaches to an Enduring Problem,* Reading, Mass.: Addison-Wesley, 1976.

Guptka, R. C., and Kaford, J. Toxicological statistics for barbiturates, other sedatives and tranquilizers in Ontario: a ten year survey. *Canadian Medical Association Journal,* 94:863-865, 1966.

Haberman, P. W., and Baden, M. M. Drinking, drugs and death. *International Journal of the Addictions,* 9:761-773, 1974.

Hansteen, R. W.; Miller, R. D.; Lonero, L.; Reid, L. D.; and Jones, B. Effects of cannabis and alcohol on automobile driving and psychomotor tracking. *Annals of the New York Academy of Sciences,* 282:240-256, 1976.

Hollister, L. E. Valium: a discussion of current issues. *Psychosomatics,* 18:44-58, 1977.

Horvath, D. To what extent in what form do some so-called "fashionable" drugs affect the action of alcohol? *Orvosi Hetilap,* 104:2233-2236, 1963.

Hughes, F. W., and Forney, R. B. Comparative effect of three antihistamines and ethanol on mental and motor performance. *Clinical Pharmacology and Therapeutics,* 5:414-421, 1964.

Hughes, F. W.; Forney, R. B.; and Richards, A. B. Comparative effects in human subjects of chlordiazepoxide, diazepam and placebo on mental and physical performance using a pursuit meter with and without low levels of alcohol. *Clinical Pharmacology and Therapeutics,* 6:139-145, 1965.

Hurst, P. M.; Radlow, R.; Chubb, N. C.; and Bagley, S. K. Effects of alcohol and d-amphetamine upon mood and volition. *Psychological Reports,*24: 975-987, 1969.

Inaba, D. S.; Gay, G. R.; Newmeyer, J. A.; and Whitehead, C. Methaqualone abuse: luding out. *Journal of the American Medical Association,* 224: 1505-1509, 1973.

Kaplan, H. L.; Forney, R. B.; Richards, A. B.; and Hughes, F. W. Dextroamphetamine, alcohol and dextroamphetamine-alcohol combinations and mental performance. In: Harger, R. N., ed. *Alcohol and Traffic Safety.* Bloomington: Indiana University Press, 1966.

Kiplinger, G. F.; Sokol, G.; and Rhoda, B. E. Effects of combined alcohol and propoxyphene on human performance. *Archives of International Pharmacodynamics,* 213:175-180, 1974.

Kipperman, A., and Fine, E. W. The combined abuse of alcohol and amphetamines. *American Journal of Psychiatry,* 131:1277-1280, 1974.

Kissin, B., Interactions of ethyl alcohol and other drugs. In: Kissin, B., and Begleiter, H., eds. *The Biology of Alcoholism.* Vol. III. New York: Plenum Press, 1974.

Landauer, A. A.; Milner, G.; and Patman, J. Alcohol-antidepressant combinations: Impaired psychomotor performance. *Science,* 163:1467-1468, 1969.

Lawton, M. P. and Cann, B. The effects of diazepam (Valium) and alcohol on psychomotor performance. *Journal of Nervous and Mental Disease,* 136:550-554, 1963.

Lickint, F. The evoking of abnormal alcohol reactions by drugs. *Therapiewoche,* 7:414-418, 1957.

Linnoila, M. Effects of antihistamines, chlormethazone and alcohol on psychomotor skills related to driving. *European Journal of Clinical Pharmacology,* 5:247-254, 1973.

Linnoila, M., and Mattila, M. J. Drug interaction on psychomotor skills related to driving: diazepam and alcohol. *European Journal of Clinical Pharmacology,* 5:186-194, 1973.

Loomis, T. A. Effects of alcohol on persons using tranquilizers. In: Harvard, J.D.J., ed. *Proceedings of the Third International Conference on Alcohol and Road Traffic.* London: British Medical Association, 1963.

Macavoy, M. G., and Marks, D. F. Divided attention performance of cannabis users and non-users following cannabis and alcohol. *Psychopharmacologia,* 44:147-152, 1975.

Macht, D. I., and Davis, M. E. Synergistic and antagonistic effects of alcohol, caffeine and nicotine mixtures. *American Journal of Physiology,* 109:67-68, 1934.

Manno, J. E.; Kiplinger, G. F.; Scholz, N.; Forney, R. B.; and Haine, S. E. The influence of alcohol and marijuana on motor and mental performance. *Clinical Pharmacology and Therapeutics,* 12:202-211, 1971.

Miller, A. I.; D'Agostino, A.; and Minsky, R. Effects of combined chlordiazepoxide and alcohol in man. *Quarterly Journal of Studies on Alcohol,* 24:9-13, 1963.

Milner, G. Interaction of barbiturates, alcohol and some psychotropic drugs. *Medical Journal of Australia,* 1:1204-1207, 1970.

Molander, L., and Duvok, L. Acute effects of oxazepam and methylperone, alone and in combination with alcohol on sedation: coordination and mood. *Acta Pharmacologica et Toxicologica,* 38:145-160, 1976.

Moller, K. D. Death from therapeutic doses of morphine or morphine-scopolamine in persons affected by alcohol or barbituric acid. *Bulletin of Narcotics,* 5:11-19, 1953.

Moreland, J.; Setekleiv, J.; Hoffner, H.H.W.; Stromsaether, C. E.; Danielsen, A.; and Holst Wethe, G. Combined effects of diazepam and ethanol on mental and psychomotor functions. *Acta Pharmacologica et Toxicologica,* 34:5-15, 1974.

Moskowitz, H. Marijuana and Driving. *Accident Analysis Prevention* 9:21-26, 1976.

Moskowitz, H. and Burns, M. "The Effects of Alcohol and Valium Singly and in Combination upon Driving Related Skills Performance." Unpublished, 1977.

Mould, G. P.; Curry, S. H.; and Binns, T. B. Interaction of glutethimide and phenobarbitone with ethanol in man. *Journal of Pharmacy and Pharmacology,* 24:894-899, 1972.

Munkelt, P.; Lienert, G. P.; Frahm, M.; and Soehring, K. Sex specific differences in effect of alcohol combined with meprobamate on psychologically stable and labile subjects. *Arzneimittel Forshung,* 12:1059-1065, 1962.

Nash, H. Psychological effects and alcohol-antagonizing properties of caffeine. *Quarterly Journal of Studies on Alcohol,* 27:727-734, 1966.

National Institute on Drug Abuse. *National Drug/Alcohol Collaborative Project: Issues in Multiple Substance Abuse,* Gardner, S. E., ed. DHEW Pub. No. (ADM)80-957. Washington, D.C.: Supt. of Docs., U.S. Govt. Print. Off., 1980.

National Institute on Drug Abuse. *DAWN IV.* Rockville, Md.: the Institute, 1976.

Newman, H. W., and Newman, E. J. Failure of Dexedrine and caffeine as practical antagonists of the depressant effects of ethyl alcohol in man. *Quarterly Journal of Studies on Alcohol,* 17:406-410, 1956.

O'Donnell, J. A.; Voss, H. L.; Clayton, R. R.; Slatim, G. I.; and Room, R.G.W. *Young Men and Drugs —A Nationwide Survey.* NIDA Research Monograph 5. Rockville, Md.: National Institute on Drug Abuse, 1976.

Palva, E. S. Effect of active metabolites of chlordiazepoxide and diazepam alone and in combination with alcohol on psychomotor skills related to driving. *Modern Problems of Pharmacopsychiatry,* 2:79-84, 1976.

Reisby, N. and Theilgaard, A. The interaction of alcohol and meprobamate in man. *Acta Psychiatrica Scandinavia, Supplement,* 208:5-204, 1968.

Roizen, L. "Interactions of methadone and ethanol." Paper presented at the 1969 Meeting of the Eastern Section of the American Psychiatric Association, New York, 1969.

Seevers, M. J. Amphetamines and alcohol. *Journal of the American Medical Association,* 184:843, 1963.

Sellers, E. M.; Carr, G.; and Bernstein, J. G. interaction of chloral hydrate and ethanol in man. *Clinical Pharmacology and Therapeutics,* 13:50-58, 1972.

Seppola, T. M.; Linnoila, M.; Elonen, E.; Mattila, M. J.; Martti, M.; Effect of tricyclic antidepressants and alcohol on psychomotor skills related to driving. *Clinical Pharmacology and Therapeutics,* 17:515-522, 1975.

Simon, W., and Lucero, R. J. Consumption of mentholated cigarettes by alcoholics. *Diseases of the Nervous System,* 21:213-214, 1960.

Simpson, D. D., and Lloyd, M. R. *Alcohol and Illicit Drug Use.* Institute of Behavioral Research Report 77-2. Fort Worth: Texas Christian University, 1977.

Smiley, A.; LeBlanc, A. E.; French, I. W.; and Burford, R. The combined effect of alcohol and common psychoactive drugs. II: Field studies with an instrumented automobile. In: Isrealstam, S., and Lambert, S., eds. *Alcohol, Drugs and Traffic Safety.* Toronto: Addiction Research Foundation, 1975.

Tinklenberg, J. Drugs and crime. In: National Commission on Marijuana and Drug Abuse. *Drug Use in America: Problem in Perspective.* Appendix. Vol. I. Technical Papers of the Second Report of the Commission. Washington, D.C.: U.S. Government Printing Office, 1973.

Tuckfeld, B. S.; McLeary, K. R.; and Waterhouse, G. J. *Multiple Drug Use Among Persons with Alcohol-Related Problems.* Springfield, Va.: National Technical Information Service, 1975.

Vaapatalo, H., and Karppanen, H. Combined toxicity of ethanol with chlorpromazine, diazepam, chlormethiazole or pentobarbital in mice. *Agents Action* 1:43-45, 1969.

Votarova, Z., and Dyntarova, H. Comparison of the chlormethiazole and diazepam effects on alcohol induced changes of EEG and behavior in rats. In: *Collegium Internationale Neuro-psychopharmacologium* (C.I.N.P.) Abstracts II. Prague: International Conference on Neuropsychopharmacology, 1970.

Weiss, B., and Laties, V. G. Effects of amphetamine, chlorpromazine, pentobarbital and ethanol on operant response conditioning. *Journal of Pharmacology and Experimental Therapeutics,* 144:17-23, 1964.

Wilson, L.; Taylor, J. D.; Nash, C.W.; and Cameron, D. F. The combined effects of ethanol and amphetamine sulfate on performance in human subjects. *Canadian Medical Association Journal,* 94:478-484, 1966.

Zirkle, G. A.; McAtee, O. B.; King, P. D.; and Van Dyke, R. Meprobamate and small amounts of alcohol: effects on human ability, coordination and judgment. *Journal of the American Medical Association,*173:1823-1825, 1960.

Chapter 2
Current Patterns of Psychoactive Drug Use: Some Epidemiologic Observations

Harvey Alan Siegal, Ph.D.
School of Medicine
Wright State University

INTRODUCTION

Social scientists concerned with drug abuse would do well to remember the parable of the blind men and the elephant. As the story goes, several blind men are asked to describe what is in front of them. The man standing at the animal's side reaches out and describes a wide expanse of wall; the individual confronted by the trunk claims that he feels a heavy, snakelike tube. Some, patting the elephant's tail, report that it feels like a rope, while others describe the legs as trunks of trees. Drug abuse is our elephant: Methodologies and technologies provide us with an accurate yet necessarily limited picture of the phenomenon that confronts us. Much like blind men, each of us employs only one methodological stance and examines limited aspects of the problem. As a result, we are likely to arrive at incomplete perceptions of drug use or abuse.

To extend the analogy, what happens if the blind men are asked to describe a moving elephant? How much more complicated does this render the problem? It is uncertain how accurate are the conceptual tools we currently have to assess changing social phenomena. All the same, we are regularly called upon to make such assessments in the area of substance abuse by describing and analyzing not only the parameters but also the content and processes of psychoactive drug use and/or abuse. We assume that in some way all aspects of the phenomenon of substance abuse do actually fit together, yet we cannot describe specifically how they mesh. Minimally, we can set forth as clearly as possible the limitations inherent in our data and identify and describe common variables.

This chapter will limit itself to the *epidemiology* of psychoactive drug use and abuse. The discipline of epidemiology encompasses a fairly large number of perspectives. Traditionally it referred to the emergence, occurrence, and spread of (infectious) disease within a population; i.e., the locating and tracing of "epidemics." More recently, however, the discipline has come to include a broader perspective encompassing a behavioral dimension. Today epidemiologists are as likely to concern themselves with trends or patterns of behavior occurring within a population and the bearing that this behavior has on health. It is this larger, more inclusive meaning which will be used throughout the discussion to come. More specifically, this chapter will concern itself with what people do (or report that they do); and, in an even narrower sense, how specific subgroups of the population (e.g., males versus females, whites versus blacks) distinguish themselves in relation to the identified behavior.

More specifically, the following are the objectives of this chapter:

- An overview of the use of alcohol by the American population

- An overview of the use of legal psychoactive drugs within a medical context
- An overview of the nonmedical use of psychoactive drugs
- An overview of the use of over-the-counter psychoactive drugs
- An overview of the use of illegal drugs in selected cohorts and populations

In each of these areas descriptive material on the social and demographic characteristics of the users will be presented. As much as possible, given the data available, it will be attempted to examine the concurrent use of alcohol and other psychoactive drugs.

In order to meet these objectives, the chapter presents and compares the findings of a number of disparate studies, each of which examines an aspect of the phenomenon from a particular methodological perspective. And while the discussion endeavors to summarize several prominent studies, it is not intended to represent a compendium of current drug abuse literature. Studies will provide data from several collection sites which are necessary to comprehensive epidemiological research. Included are:

- *General population incidence and prevalence data.* These can provide a overview of the general population. Prevalence data provide information on the magnitude of the condition, while incidence alludes to its spread or growth. Such data are invaluable to both service and planning needs.
- *Intervention data.* These capture that specific part of the problem population which has already experienced significant problems associated with substance use. Two such measures will be examined below. First, data will be presented about individuals seeking treatment specifically *for* their drug problem, those who wish to stop taking drugs or to learn how to cope with their drug problems. Second, data about those presenting themselves at a medical facility complaining/suffering from an acute drug reaction will also be presented.
- *Special-population high-risk subgroup data.* These report on individuals considered to be particularly at risk for drug problems—e.g., "street people" or groups whose social and demographic characteristics would make them likely to be involved in the use of drugs. Such data can assist in pinpointing a problem or target population; however, they are less useful for projection purposes.

Unfortunately, like the blind men in the parable, each of these data sources reveals only part of the unseen beast. While projection devices capable of representing the whole population by using a number of key factors or indicators have been developed, an ongoing debate challenges the validity of such measures (Gould et al. 1976; O'Donnell et al. 1976). Therefore, social scientists still disagree about how to meaningfully integrate these data.

Professional disagreement extends as far as basic terminology. Take, for example, the idea of the concurrent use of more than one drug—often called "polydrug use". Dr. Robert DuPont, former Director of the National Institute on Drug Abuse, describes the concept as "political or official," created to fill a void in overall intervention schemes (DuPont 1976). Alluding to this interpretation, James Sample in an epidemiology conference pointed out that the definition of the term is logically inconsistent: "Polydrug abuse [means] . . . the use of more than one drug, excluding heroin, which are used simultaneously and with a frequency of use of at least once per month. Regular use of heroin, regardless of how many other drugs are also used [sic] will not be classified as polydrug use" (Sample 1977a). Even more basic concepts, such as "regular use" or "current use," tend to be disputed and defined differently from study to study or for different purposes. The difficulty becomes particularly poignant when comparisons are attempted; researchers find themselves frustrated by the plethora of seemingly contradictory conceptual designations (Sample 1977b).

Again, the situation becomes even more complex when value judgments can seemingly be read into the basic designations used. Studies of drinking behavior are relevant here. One of the most significant of the alcohol epidemiological studies was the *American Drinking Practices* study by the Social Research Group (Cahalan et al. 1964). This research described drinking behavior by five designations: abstainers, infrequent drinkers, light, moderate, and heavy drinkers. These designations were computed using the *quantity* one consumed ("how much"), the *frequency* ("how often") one drinks, and the *variability* ("how typical or usual") of this pattern. Therefore a "heavy drinker" could be one who only drinks two or three times a month but also usually consumes five or six drinks during these incidents; or, who consumes one or two drinks every day, but has as many as five or six drinks "once in a while"; or, drinks three or four drinks several times a week (Cahalan et al. 1964).

The label of "heavy drinker" can be a pejorative one; consequently, a significant amount of controversy is generated. The basic question suggested by this study remains: How can statistics be translated into meaningful descriptive categories?

Finally, the issue of change presents another complication. The use of psychoactive drugs may be based upon (drug) availability, patterns of law enforcement, social fads, etc. As a result, some researchers have questioned the use of epidemiological surveys focusing only on measures of incidence and prevalence (Robins 1977). For this reason, treatment and intervention data are included in this presentation.

The above discussion is offered to sensitize the reader to the strengths and weaknesses of the data. When statistics, representing various research studies, are presented in the following report the projections and estimations drawn from them represent *problem indicators* which can point toward existent and/or emerging patterns. They should *not* be interpreted as having a reality of their own.

ORGANIZATION AND PRESENTATION

The chapter will examine the use of conceptually different *categories* of psychoactive drugs and will use a series of existing data sets for analysis. This organizational scheme is employed because a single, integrated data source is not available. It begins with an examination of the use and misuse of alcohol. The discussion then proceeds to nonprescription over-the-counter drugs, prescription drugs used in a medical context, and—finally—the nonmedical use of both illegal drugs (e.g., marijauna, heroin, etc.) and (prescription) psychoactive drugs. To complement these data obtained through surveys, intervention data drawn from sources such as the Drug Abuse Warning Network (DAWN) and the Client-Oriented Data Acquisition Process (CODAP) will be presented.

The data are presented so that standard demographic and sociological variables can be highlighted. These include sex, age, and race/ethnicity; where available, occupational status and education will be provided. These sociological and demographic dimensions are the ones that are most uniformly recorded across all studies. Moreover—and perhaps of even greater significance—is the assumption that age, sex, and ethnicity are among the most powerful determinants of behavior.

ALCOHOL USE BY AMERICANS

Alcohol in beverage form is the nation's most commonly used (and abused) substance; through the use of large-scale epidemiological studies we probably know more about our peoples' consumption patterns than any other psychoactive drug. The consumption of alcoholic beverages is a social norm in the United States. In 1964-65, the *American Drinking Practices* study examined a cross section of the population. This survey indicated that less than half (47 percent) of the adult population (aged 21 and over) did not drink or drank less than once a month. The majority, however—some 53 percent—could be considered "regular drinkers," consuming some alcohol (either beer, wine, or spirits) at least once a month (Cahalan et al. 1964).

Shortly after this study, the Federal Government sponsored a series of investigations aimed at measuring the specifics of alcohol consumption in the national population. This research, through four separate surveys, extended the population base under study to persons 18 years of age and older. The findings of the Harris Survey (1972-74) suggested that the proportion of drinkers had increased, placing the representation of abstainers and infrequent drinkers at only 42 percent (U.S. Department of Health, Education, and Welfare 1974). Further, a study by Gallup focusing on adults aged 18 and older suggested that 68 percent of the population drinks alcoholic beverages. The interpretation of these findings presents some problems. Differences in the definition of the base population (including for example, lowering the age spread to 18 rather than 21) may account for the different findings; choice of methodology may also be a complicating factor. Finally, drinking patterns may have changed over the past decade and a half (*Alcohol and Health* 1974).

In this chapter we will rely heavily on the work of Dr. Carl D. Chambers and his associates published in a book entitled *Chemical Coping*. The statistics presented in *Chemical Coping* are derived from some 30,000 personal interviews of persons currently living in households and conducted over a 4-year period; 30 states and localities are represented

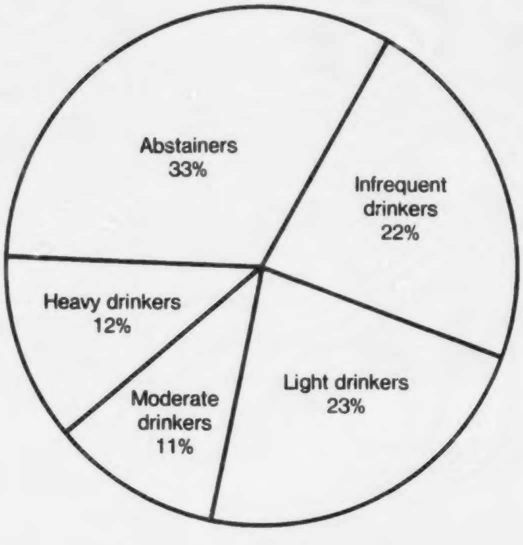
(Chambers 1975).[1] The consumption index used in *Chemical Coping* is wholly compatible to that used in the *American Drinking Practices* survey by Cahalan et al. (1964). Therefore, the classification of drinking patterns and practices is comparable. What differs significantly, however, is that *Chemical Coping* examined the consumption patterns of persons 14 years old and above (cf. *American Drinking Practices* study population of 21 and older); therefore, it represents a much wider population base (Chambers 1975). The data are unequivocal in their indication that alcohol use (or experimentation) is a norm in the United States: More than four-fifths of our population aged 14 and above have drunk alcohol on at least one occasion in their lives.

Prevalence

Figure 1 provides a representation of the estimated current drinking patterns of our population.

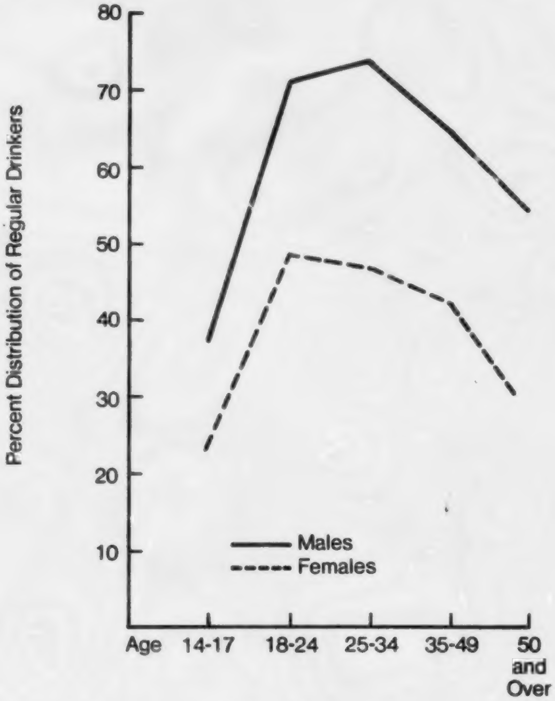
In an aggregate sense, only one-third of the nation's population aged 14 and above claim abstinence. The remaining two-thirds, projected to be 68 percent, drank some alcohol in the year preceding the research. Approximately half of these are regular drinkers—that is, people who consume some alcoholic beverage at least once a month.

FIGURE 1.—Distribution of alcohol usage patterns



Source: Chambers 1975, *Chemical Coping*.
Copyright 1975 by Spectrum Publications.

FIGURE 2.—Regular drinkers—sex and age by cohort



Source: Chambers 1975, *Chemical Coping*.
Copyright 1975 by Spectrum Publications.

Using a consumption index (see the description provided above) in Cahalan et al. (1964) which combined variables such as the *quantity* consumed, the *frequency* of drinking, and the regularity or *variability* of the drinking pattern, the drinking population can be categorized primarily as either "light"; "moderate"; or "heavy" drinkers (as represented in figure 1).

When the drinking patterns are analyzed, the three major groups tend to distinguish themselves on a number of demographic and sociological characteristics. Two of the most apparent are sex and age.

Sex and Age

Consider the distribution of regular drinkers by sex presented in table 1. While the representation

---

[1] This study differs markedly from other surveys in that its 30,000 household interviews do not represent a single probability sample. As such, the projections are not determined by the more rigorous sampling techniques found in other studies. The major strength of the work rests in the size of the sample and in the fact that the information was elicited consistently throughout the studies; again, the caveat that these data should not be considered as problem indicators should be reinforced.

TABLE 1.—*Distribution of regular drinkers, by sex*

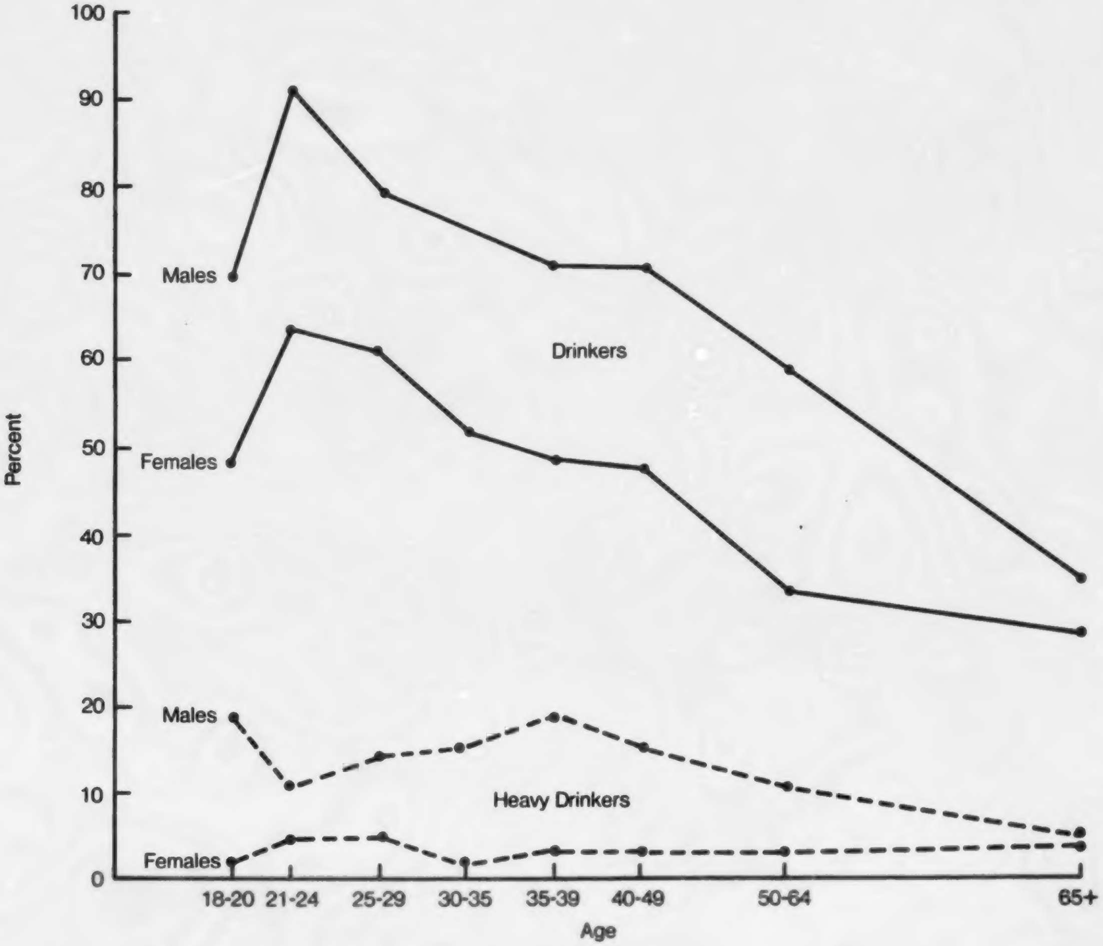
Sex	Percent regular drinkers	Percent representation in general population age 14 and over
Male	61	46
Female	39	54

of males in the population of regular drinkers remains noticeably higher than females, there is much speculation that the regular use of alcohol is increasing among women.

The regular use of alcohol is also related to age. Figure 2 presents a composite of the relationship of both variables to alcohol use. The highest proportions of regular drinkers (about 75 percent for males, 50 for females) occur during the early adult years. While the curves vary slightly in shape, the trends that they represent appear to hold for both sexes. Sociologically, the early adult years emphasize both sociability and stress. The transition from student or otherwise dependent status to full autonomy can result in the widening of a young person's social world. Since the American culture emphasizes the social use of alcohol, the increase of such use into young adulthood is not surprising. Moreover, new stresses and demands necessitate new coping mechanisms; and the regular use of alcoholic beverages may constitute such a mechanism.

The suggestion that there is a strong connection between drinking behavior and age can be seen in an inverse relationship: As persons get older, their consumption—both in incidence and intensity—declines. Consider figure 3, in which the slopes of

FIGURE 3.—Percent of regular and heavy drinkers among American adults, by sex and age, Fall 1972



Source: U.S. Department of Health, Education, and Welfare 1974.

the curves represented by both the Harris study and *Chemical Coping* interviews are similar. Here both consumption and intensity demonstrate an inverse relationship with age.

However, it should be emphasized that these data curves represent a cross section of the population and not a longitudinal study.

Race/Ethnicity

The relationship between race/ethnicity and alcohol consumption has been well documented. Early studies have described the use of alcohol as primarily a food or food supplement in French, Italian, and other Mediterranean cultures (U.S. Department of Health, Education, and Welfare 1974). It is also recognized as a ceremonial accessory for Jewish people. While remnants of these original ethnic differences still persist, racial differences are probably more important today. In *Chemical Coping* (Chambers 1975), the racial distribution presented in table 2 was observed.

TABLE 2.—*Racial distribution of regular drinkers, in percent*

Major racial groups	Regular drinkers	Distribution in the general population
White	85	89
Black	12	10
Other	3	1

Source: Chambers 1975. Copyright 1975 by Spectrum Publications.

Social Class

Studies exploring the relationship between alcohol use and social class have determined that the regular use of alcohol does not predominate in any given class (U.S. Department of Health, Education, and Welfare 1974). However, while *prevalence* (or extent) of alcohol use occurs throughout the social class structure, the *intensity* (or "how much") of consumption suggests a negative relationship to social class. Much speculation—ranging from hypotheses about coping mechanisms to those concerned with cultural patterns—has been offered in conjunction with the observation. As yet, however, definitive research is lacking. The relationship of drinking intensity to social class and status will be explored in more depth below in relation to heavy drinkers.

Employment

Because the use of alcohol is a social norm, we would expect the majority of the nation's regular drinkers to be employed. This proves to be the case. The author has prepared a comparison of the occupational distribution of the nation's regular drinkers with that of the general population, according to the 1970 census. (See table 3).

Note that regular drinking is not uniformly distributed throughout the occupational structure. A degree of overrepresentation can be observed in each of the categories except for the white collar and clerical group; the large representation of females in these categories might partially explain the difference. Drinking is also related to the relative prestige of the occupations. The patterns of overrepresentation are most pronounced in the trades groups and among unskilled workers.

The use of alcohol is considered normal behavior: Most people have been able to integrate it successfully into their lifestyles. What about heavy drinkers—persons who use alcohol daily (or almost daily) and are likely to consume several drinks at each episode? Can they be distinguished in any way? The data indicated that the social and demographic characteristics of this group do distinguish them from the larger drinking population.

TABLE 3.—*Distribution of regular drinkers by occupational status, in percent*

Group by occupational status	Proportion of regular drinkers	Representation in the general population
Professionals, technical managers	16	14
White collar, clerical	5	10
Skilled, semiskilled	21	17
Unskilled	7	3
Male high school students	4	5
Female high school students	2	5
Male college students	3	3
Female college students	2	2
Housewives	16	24

Source: Chambers 1975, *Chemical Coping*. Copyright 1975 by Spectrum Publication.

Heavy Drinkers

Sex and Age

It has been shown that the representation of males in the nation's drinking population exceeds its representation in the larger population. This relationship is even more striking in those drinkers whose consumption pattern can be classified as heavy. Consider the distribution shown in table 4.

TABLE 4.—*Distribution of heavy versus regular drinkers and base population, in percent*

Sex	Percent general population	Percent moderate/ light drinkers	Percent heavy drinkers
Males	46	55	77
Females	54	45	23

These data point to clear sex differences in degree of alcohol consumption. While recent data suggest that this pattern may be changing, the population of heavy drinkers will probably remain predominantly male for the foreseeable future.

The data displayed in figures 2 and 3 show the strong relationship between alcohol use and age. As the cross-sectional data indicated previously, drinking tends to begin early in an individual's life, progresses steadily through the late adolescent and early adult years, reaches a peak in the late twenties and thirties, and then gradually declines as the individual matures. For the "heavy drinker" (especially in the male group) the peak tends to occur later: For the males it is in the late thirties rather than the late twenties; for women, it reaches into the late rather than the early twenties. One explanation for the sex and age relationship might posit that concurrent patterns of life stress and social expectations affect women at an earlier point in time than they affect men.

Ethnicity/Race

The available data indicate that ethnicity and/or race do affect degree of drinking (U.S. Department of Health, Education, and Welfare 1974). Many of the research studies point to the difference in *intensity* (the amount consumed) versus *incidence* (the number of occasions one consumes) of drinking. The Jewish population for example, has a relatively high incidence of consumption, but on specific occasions they tend to be moderate in their intake (*Alcohol and Health 1972*).

The data derived from the combination of studies presented in *Chemical Coping* suggest that although minority groups tend not to be overrepresented in their *use* of alcohol, certain groups who do drink tend to consume more (Chambers 1975). This observation encourages a number of explanations ranging from observed differences in subcultural patterns to the hypothesis that heavy drinking is an adaptation to the stresses of underclass life by certain minority group members. These speculations should necessarily be research priorities in the future.

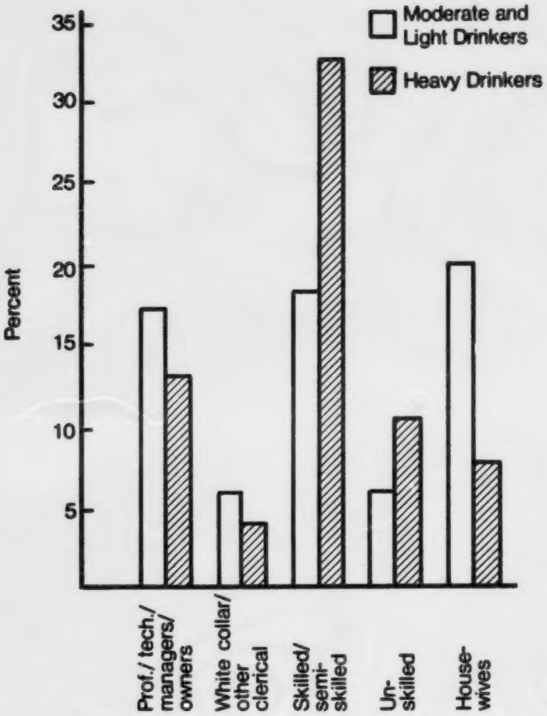
Social Class

Heavy drinking is also associated with social class. Not surprisingly, the data suggest an overrepresentation of lower class persons among heavy drinkers. When class is considered and other factors controlled for, the representation of higher status persons—upper and upper-middle class—indicates a preponderance of moderate and light drinkers (24 percent are classified in the moderate/light category, while 17 percent are classified as heavy drinkers). Among the middle class, the representation is relatively balanced between heavy and moderate/light consumption patterns (about 8 percent each). Finally, when the lower class is considered, the picture changes drastically. In this group the representation of heavy drinkers noticeably exceeds those classified in the moderate and light categories (about 16 percent heavy versus 10 percent moderate/light). Again, several interpretations—such as those emphasizing cultural or adaptive functions—are plausible. Both epidemiological and social psychological research focusing on alcohol use by different social classes in a variety of ecological settings is needed to increase the understanding of drinking behavior.

Employment

Occupational status and drinking patterns demonstrate a relationship similar to that observable for consumption and social class. While the incidence of drinking tends to enjoy a positive relationship with higher-status occupational categories, the intensity of consumption demonstrates an inverse relationship. Consider figure 4. Heavy drinking is more prevalent in the trades (skilled and semiskilled categories) and among unskilled workers than among white collar workers and professionals. Studies have indicated that those occupational differences in consumption patterns are independent of social class (U.S. Department of Health, Education, and Welfare 1974).

FIGURE 4.—Employment status characteristics and drinking patterns



Source: Chambers 1975, *Chemical Coping*. Copyright 1975 by Spectrum Publications.

Recently, alcohol use by armed services personnel has attracted scientific notice. Two separate studies of drinking patterns, one concentrating on the Army and the other on the Navy, have indicated that both officers and enlisted men drink more often and more intensely than civilians of corresponding ages. Heavy drinking and problem drinking (usually meaning drinking that causes problems with home/family life, occupation, or the legal system) declined with increasing age, rank, and length of service. However, older enlisted men continued to drink heavily and to drink *more* than the younger enlisted men. While both studies are regarded as more preliminary than definitive, they do provide significant data addressing alcohol consumption patterns (U.S. Department of Health, Education, and Welfare 1974).

This section has attempted to summarize some of what is known about the consumption of beverage alcohol. Alcohol is without question the psychoactive substance which enjoys the greatest incidence of use; consequently it can be assumed to cause the greatest amount of personal and social damage. More significantly, however, since alcohol is typically the first psychoactive agent that one experiments with, it is not unlikely that attitudes concerning its use will influence the ways in which other substances are used and/or abused. There has been little research to date on the formation of norms governing early drug use and its effect on later patterns of substance use. Unraveling and understanding this relationship should be seen as an important area of future inquiry.

OVER-THE-COUNTER PSYCHOACTIVE MEDICINES

The American pharmacopoeia provides an almost endless supply and variety of drugs which promise to assist with all of life's problems; the mass media are saturated with advertisements to this effect. Not the least of these are the psychoactives which focus essentially on four areas: anxiety or stress, insomnia, fatigue, and pain. The first three of these are of particular concern in this report. Unlike drinking behavior, the use/potential misuse of over-the-counter psychoactive medicines has not, until recently, been identified as a significant social problem. This section will employ the data presented in *Chemical Coping* to describe the parameters and extent of over-the-counter use of drugs by the general population aged 14 years and above.

Sleep Inducers

The available survey data suggest that the use of over-the-counter hypnotics (any drug used as a sleep inducer) is widespread. Chambers et al. (1975) suggests that almost 18 million people—roughly 12 percent of the study population—have at one time taken a nonprescription sleeping pill. (Some common brand names are Sominex and Sleep-eze.) These data were projected to indicate that as many as 4 million people may have used one of the medications within the past 6 months. Focusing on those who have used any of these preparations within the last 6 months, some significant distinctions appear in the population.

Age and sex are strongly related to the use of these medications. (See figure 5.) Sixty-two percent of the recent users are women; women, however, account for only 54 percent of the base population. Over-the-counter hypnotics are also more commonly used by older persons; almost half (46 percent) of the current users of these medications are aged 50 and above.

Other social distinctions do not appear to be as closely related to current use as age and sex. Distribution by ethnicity and social class, for example, are fairly consonant with general population projections.

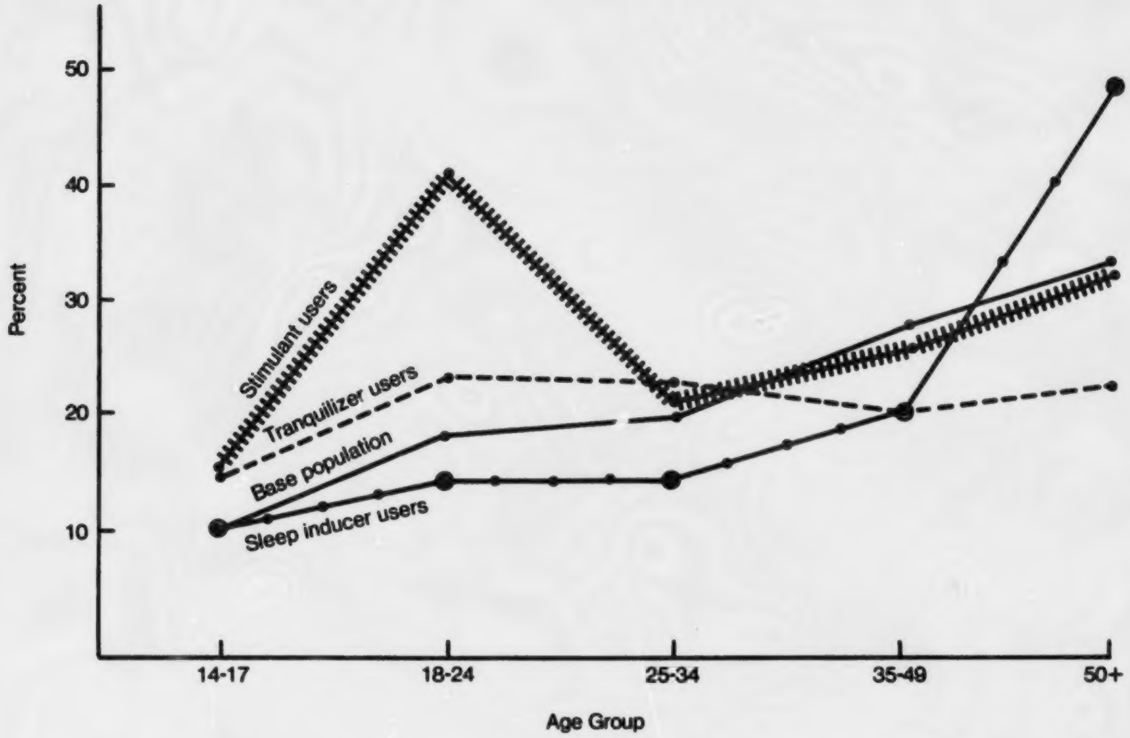
The projections made from these data suggest that the major consumers of these over-the-counter sleeping medicines are housewives, persons who have retired; and those who are either unemployed or not currently in the labor force. Consider the distributions presented in table 5. Here, the unemployed/not in the labor force categories are clearly overrepresented.

TABLE 5.—*Current users of nonprescription hypnotics*

Occupational/non-occupational status	Approximate distribution of the population, in percent	Distribution of users of non-prescription sleep inducers, in percent
Females:		
Students	7	6
Employed	21	14
Unemployed/not in labor force	26	42
Males:		
Students	8	4
Employed	36	19
Unemployed/not in labor force	2	15

Source: Chambers 1975, *Chemical Coping*. Copyright 1975 by Spectrum Publications.

FIGURE 5.—Distribution by over-the-counter drug and age



Source: Chambers 1975, *Chemical Coping*. Copyright 1975 by Spectrum Publications.

Over-the-Counter Tranquilizers

Recently arrived on the proprietary market are the tranquilizers (e.g., Compoz, Quiet World). Women, especially those above 35, are strongly represented among the population of current/regular users (Chambers 1975).

There is somewhat more of a tendency for middle and upper-middle class women to be regular/current users of these medications. Moreover, whites are more likely to be users than nonwhites (Chambers 1975).

Over-the-Counter Stimulants

The use of over-the-counter stimulants seems to occur most frequently among the young and the employed. (Examples of these medications include NoDoz and Vivarin.) The data suggest that the major users of these medications are students of both sexes and employed males. Students comprise 23 percent of recent users, and employed males comprise an additional 45 percent of the same population. If the occupational areas of these workers are defined, the primary overrepresentations occur in the trades (unskilled/skilled workers) and among the service and sales occupations. These data are fully displayed in tables 6 and 7.

As the trades and service/sales personnel are overrepresented, it might be conjectured that these medications are being used to increase performance/productivity on the job.

TABLE 6.—*All current users of over-the-counter stimulants, in percent*

Occupational/non-occupational status	Approximate distribution of the population	Distribution of users of proprietary stimulants
Females:		
Students	7	10
Employed	21	13
Unemployed/not in labor force	26	12
Males:		
Students	8	13
Employed	36	45
Unemployed/not in labor force	2	7

Source: Chambers 1975, *Chemical Coping*. Copyright 1975 by Spectrum Publications.

Summary of Over-the-Counter Psychoactive Drug Use

The use of over-the-counter psychoactive drugs is widespread. The results of research sponsored by the National Commission on Marijuana and Drug Abuse in 1971 suggested that at least 13 percent of all network television commercials are devoted to promoting over-the-counter medications (the Commission 1972, 1973), suggesting that the market must be a lucrative one. A recent report suggests that the average family of four spends 64 cents per week on proprietary drugs; these medications represent some 25 percent of the total drug market (the Commission 1972, 1973). If a need does not currently exist, these media campaigns are probably helping to establish one.

While many persons have used and currently do use these over-the-counter medications, it appears that there are noticeable differences in use of the different *kinds* of proprietary drugs. Data on drug type correlated with age have been combined in figure 5. The concentration of stimulant users in the young adult (ages 18-24) cohort—primarily workers and students—encourages the speculation that this population is using the over-the-counter stimulants to increase productivity or performance; to maintain productivity and/or performance in the face of competing demands or a combination of both. Caffeine, the principal ingredient of these proprietary drugs, has little of the abuse potential of the sympathomimetic amines since the reaction it engenders does not begin to approach that of the amphetamine and amphetaminelike drugs. Other research suggests that it is not likely that many of the users are entirely satisfied with these drugs (Parry 1973).

TABLE 7.—*Employed current users of over-the-counter stimulants, in percent*

Worker Classification	Approximate distribution of total labor force	Percent of total users of OTC stimulants
Unskilled	5	12
Skilled/semiskilled	29	34
White collar/other	17	4
Clerical professionals, manager owners	23	10
Service/sales/others	26	40

Source: Chambers 1975, *Chemical Coping*. Copyright 1975 by Spectrum Publications.

TABLE 8.—*Drug classes: distribution of regular users by sex, in percent*

	Hypnotics		Stimulants		Tranquilizers	
Sex	Prescription	OTC	Prescription	OTC	Prescription	OTC
Male	43	38	63	65	33	30
Female	57	62	37	35	67	70

Source: Chambers 1975, *Chemical Coping*. Copyright 1975 by Spectrum Publications.

The striking concentration of hypnotic users in the oldest age cohort is more difficult to explain. It does encourage the speculation that restricted access to medical services occurs in this cohort, and the tendency toward self-medication emerges.

The curve for the age distribution of proprietary tranquilizer users roughly parallels that of the general population until the early thirties when a decrease in usage is seen.

When comparisons of regular users of these over-the-counter medications are made with the regular users of the prescription psychoactive medications (such as barbiturates, minor tranquilizers, and amphetamines), a number of interesting similarities arise. Some caution must be used in comparing these data, however. While most (about 75 percent) of the regular users of these prescription drugs report legitimate use of them—i.e., obtaining these substances wholly through their own prescription *and* using exactly as directed—a substantial proportion do not. (The author speculates that such misuse is probably overconcentrated in the younger cohorts.)

The overrepresentation of women in the population of over-the-counter hypnotic users (seen in table 8) can be examined against the overrepresentation of males among both regular *and*, especially, heavy drinkers. Since both over-the-counter hypnotics and alcohol are CNS depressants, it encourages the speculation that this represents a sex-differentiated pattern. It would be worthwhile to monitor the effects that changing drinking patterns—i.e., tendency towards the adoption of the "masculine" pattern by women—will have on the long-term use of hypnotics. In a further breakdown of drug categories—i.e., examining hypnotics, stimulants, and tranquilizers—other sexual differences emerge:

Before commenting further on these sex distribution patterns, it is also relevant to make age comparisons, which reveal some striking differences. (See table 9.) (It should be stressed that these age curves suffer from the same limitation as the "alcohol and age" distributions. The data are cross-sectional and *not* longitudinal. Therefore, on the basis of these data, we cannot conclude that there is a progression from one kind of drug to another; we can only observe that cohort behavior differs.)

This table encourages a number of observations. First, the age distribution of those who use hypnotics is remarkably consistent between over-the-counter and prescription medications. The consistency holds in the users of stimulants for persons under 35. However, the distributions essentially reverse themselves in the two older cohorts of stimulant users. Further, there appears to be a clustering of over-the-counter tranquilizer users in the younger cohorts. This would encourage the speculation that over-the-counter tranquilizers are tried first, and as the results are defined as inadequate over time, a prescription is obtained for a more potent agent.

TABLE 9.—*Drug classes: distribution of regular users by age, in percent*

	Hypnotics		Stimulants		Tranquilizers	
Age	Prescription	OTC	Prescription	OTC	Prescription	OTC
14-17	9	10	17	16	3	15
18-24	14	13	38	41	10	22
25-34	10	13	20	20	15	22
35-49	22	18	8	15	29	19
50+	45	46	17	8	44	22

Source: Chambers 1975, *Chemical Coping*. Copyright 1975 by Spectrum Publications.

PRESCRIPTION PSYCHOACTIVE DRUGS

The use, misuse, and abuse of prescription psychoactive drugs has been a major topic of concern for more than two decades. While the full extent of legal drug use is not known, there have been projections suggesting that a very sizable proportion of the population has used or is using a prescription psychoactive drug. Many persons in the professional community have been arguing for more than a decade that many of the psychotropics—especially the minor tranquilizers (such as diazepam) (Valium), sedatives, and hypnotics (especially barbiturates and nonbarbiturates such as methaqualone)—have been overprescribed. This is an ongoing debate, however, and probably will not be resolved easily.

Just as misconceptions surrounded alcohol abuse and problem drinking, many members of the medical community have a stereotyped view of the drug abuser as the "street" addict and fail to recognize the extent of medicine misuse in the general population. Too, we are just becoming aware of the long-term effects of certain of our medications. For instance, we are just discovering that diazepam is addicting and that occasionally persons on high doses of diazepam will suffer severe and even fatal withdrawal symptoms if they are suddenly removed from the drug (Blackwell 1977). Recently, the National Institute on Drug Abuse identified the misuse of sedatives and hypnotics as a major priority in terms of research and service delivery (Carter 1977). We are also beginning to realize that many people for whom powerful psychotropic agents are prescribed are ignorant of the action of these drugs and of the dangers involved in not taking them exactly as prescribed or mixing them with alcohol or other agents.

This section will examine the use of prescription psychoactive drugs. Prevalence patterns, the social and demographic characteristics of users of prescription psychoactive drugs, and related patterns of other drug usages will be presented. Data will be primarily drawn from two large survey efforts.

Prevalence

The extensive use of psychoactive drugs is a relatively new phenomenon. While many sedative/hypnotic and stimulant drugs had been developed in the early part of the twentieth century, it was not until the 1950's and later that the psychoactive armamentarium was to include a substantial range of tranquilizing and antidepressant drugs, thereby making sedation without sleep possible. Both the medical profession and the general public readily seized upon the possibilities offered by these medications, and these drugs (especially the minor tranquilizers) became some of the most prescribed in medical practice. In 1975, for example, some 87 million prescriptions were written for minor tranquilizers. Diazepam became the most widely prescribed drug in medical practice (Blackwell 1977). In 1970, alone, some 214 million prescriptions were filled for sedatives/hypnotics, stimulants (including anorectics), minor and major tranquilizers, and antidepressants. These drugs accounted for 17 percent of the total prescriptions of all kinds filled in drug stores in the United States (Parry 1973).

Data are available on the population of persons who have used—ostensibly under full medical supervision—prescription psychoactive medications for the alleviation of some symptoms of psychic distress. In mid-1973 the findings of a national study conducted during late 1970 and early 1971 were published. Data from this research, conducted under the aegis of the National Institute of Mental Health, are presented in the next section (Parry 1973). Some 2,552 persons ages 18 to 74 were surveyed by means of probability sampling methods; represented were a cross section of American adults living in households. (This of course excluded those who were institutionalized or not living in households during the study period.)

The widespread use of prescription psychotherapeutic drugs is evidenced by Table 10.

Sex, Age, and Residence

The use of these drug-types listed above is closely related to sex: Women are both more likely to use any of these agents and appear to start using these medications at an earlier age. The use of minor tranquilizers is the most commonly reported in any sex and/or age cohort. The use of stimulants is common in the younger cohorts of women; this may reflect the use of amphetamines and amphetaminelike medications in weight control programs (Parry 1973).

Among women the use of (any) prescription drugs is fairly constant by cohort after age 30. Among males, however, the prevalence increases

TABLE 10.—*Use of prescription psychotherapeutic drugs during the past year by drug class and by sex and age, in percent*

Sex/drug class	Age group 18–29	30–44	45–69	60–74	All persons
Men:					
Minor tranquilizer/ sedative	5	7	9	11	8
Stimulant	1	2	2	1	2
Hypnotic	1	1	2	7	3
Antidepressant	(1)	2	1	4	2
Major tranquilizer	(2)	1	1	(2)	1
Used any	6	12	14	21	13
Used none	94	88	86	79	87
Total	100	100	100	100	100
No. of persons	241	282	308	218	1,049
Women:					
Minor tranquilizer/ sedative	12	21	22	25	20
Stimulant	10	11	6	3	8
Hypnotic	3	3	4	8	4
Antidepressant	2	2	2	2	2
Major tranquilizer	1	2	2	2	2
Used any	23	32	31	32	29
Used none	77	68	69	68	71
Total	100	100	100	100	100
No. of persons	340	411	420	332	1,503

[1] No cases.

[2] Less than 0.5 percent.

Source: Parry 1973, *Archives of General Psychiatry*, June 1973, Vol. 28. Copyright 1973, American Medical Association.

steadily with more than three times as many men in the oldest cohort using these drugs than in the youngest cohort. While minor tranquilizers still remain the most frequently used medications in the *oldest cohort* of males, the representation of hypnotic users rises dramatically.

Sex, age, and area residence were closely associated with the use of psychoactive medications. Consider the distribution shown in table 11.

When the type of drug is considered, the minor tranquilizers are most prevalent regardless of region. On the other hand, persons in the West are more likely to use psychotropics than persons in other regions of the country. The use of stimulants and hypnotics is also relevant to regional breakdowns. Researchers in the NIMH study speculate that differences in regional distributions can partially be explained by differences in lifestyles, attitude, and values distinguishing the West from the rest of the country. Other studies have indicated that use of illegal drugs such as marijuana and drinking have been reported to be higher in the West.

TABLE 11.—*Use of prescription drugs by sex and region, in percent*

Sex	Northeast	North Central	South	West
Men:				
Users	11	13	11	21
Nonusers	89	87	89	79
Women:				
Users	24	29	30	37
Nonusers	76	71	70	63

Source: Parry 1973, *Archives of General Psychiatry*, June 1973, Vol. 28. Copyright 1973, American Medical Association.

Use Patterns

The study also detailed the usage patterns of these drugs by determining two characteristics of use—frequency and duration (intensity or the amount consumed was not reported on). Three usage designations resulted:

High: Those whose maximum pattern involved regular daily use for at least 2 months.

Medium: Those whose maximum pattern involved regular daily use for a period of at least a week but less than 2 months; and those whose maximum pattern involved intermittent use on at least 31 occasions.

Low: Those whose maximum pattern involved regular daily use for less than a week, and those

TABLE 12.—*Highest level of use ever attained by persons who used prescription drugs during past year by class of psychotherapeutic drug, in percent*[1]

n = 2,552

Use levels	Minor tranquilizer/ sedative	Stimulant	Hypnotic	Antidepressant	Major tranquilizer	Any
High	5	2	1	1	1	8
Medium	5	2	1	1	1	7
Low	5	1	1	([2])	([2])	6
Used any	15	5	3	2	1	22
Used none	85	95	96	98	99	78
Total	100	100	100	100	100	100

[1] Percentages are based on total population.

[2] Less than 0.5 percent.

Source: Parry 1973, *Archives of General Psychiatry*, June 1973, Vol. 28. Copyright 1973, American Medical Association.

whose maximum involved intermittent use on fewer than 31 occasions.

Table 12 outlines the level of use by the population of psychoactive drug users. Note that the distribution of the population of current users of minor tranquilizers/sedatives and hypnotics is evenly divided between the three categories; a similar distribution can be observed for the entire population of users.

When only use levels are considered, sex differences in usage patterns tend to flatten out. The distribution presented in table 13 emerges.

In summary, a high level of prescription psychoactive drug use seems to be positively associated with the three demographic and social characteristics (Parry 1973), as follows:

Age: The highest psychoactive drug seems to be concentrated in the adult cohorts.

Region: When the larger population of users is considered, the West emerges as having the largest concentration of high level users. When the data are considered for high use, regional differences tend to disappear.

Social Class: High levels of use appear to be more prevalent among the persons in the lowest quartile of the Index of Social Position scale. Among these persons, approximately half (48 percent) have been using their medications steadily for 2 months or more; of these, less than one-third (29 percent) are women who can be described as lower social class housewives. This study challenges the myth of the "middle class housewife pill popper."

TABLE 13.—*Use patterns of psychoactive drugs by sex, in percent*

Use levels	All users	Males	Females
High	37	41	36
Medium	33	30	34
Low	27	27	27
Missing data	3	1	2

Source: Parry 1973, *Archives of General Psychiatry*, June 1973, Vol. 28. Copyright 1973, American Medical Association.

Overview

Much of the data about prescription psychoactive drugs presented above raises significant issues about *both* the population receiving/demanding these medications and the practitioners who are providing them. The extent of use detailed in the above study is considerable; one might even question whether the same proportion of American adults (22 percent) actually even consulted a physician during the past year.

The study mentioned earlier (Chambers 1975, *Chemical Coping*) included a larger population base than did the NIMH research including persons aged 14 and above—and employed a different methodology. It therefore advanced a number of different projections, which are best regarded here in a complementary rather than comparative fashion. Consider the following proportion of regular users of prescription medications who use two or more drugs (Chambers 1975):

	Proportion (percent)
Barbiturates	33
Other sedatives	33
Minor tranquilizers	15
Major tranquilizers	1
Antidepressants	50
Amphetamine "pep pills"	25
Amphetamine "diet pills"	1

Although the multiple use of these medications clearly occurs frequently in the population of users, we know little about the organization of this behavior—i.e., whether all of the medications a person is taking have been prescribed by a single physician, or whether the person is under the care of several doctors, each of whom is unaware of the services provided by the others.

The data in *Chemical Coping* suggest that approximately 65 percent of these users of prescription psychoactive drugs are regular drinkers and about 10 percent of these exhibit a drinking pattern which would place them into the "heavy drinking" category. Table 14 displays further data on prescription psychotropic use and drinking.

TABLE 14.—*Regular use of prescription psychoactive drugs and alcohol*

Regular drug users[1]	Percent who are regular drinkers	Percent who are heavy drinkers
Barbiturates	50	10
Other sedatives	70	10
Minor tranquilizers	40	15
Major tranquilizers	35	10
Antidepressants	20	10
Amphetamine "pep pills"	90	50
Amphetamine "diet pills"	50	30

[1] Regular use refers to use at least once a month.

Source: Chambers 1975, *Chemical Coping*. Copyright 1975 by Spectrum Publications.

If anything, these data seem to understate the extent of dual use. Data on acute drug reactions, considered later in this chapter, show that alcohol in combination with other psychotropic drugs accounts for not less than 8 percent of the reported cases. It is probable that the public is not aware of the seriousness of concurrent usage. Moreover, it is likely that for many of these concurrent users, alcohol is not even considered a "drug," and therefore little caution is exercised in its use.

INTERVENTION DATA

The survey data presented to this point have relied on the statements provided by the study's respondents; the data which follow will be taken from institutional sources. This section will examine the sociologic and demographic characteristics of those persons who have experienced some kind of adverse reaction due to drug usage and the same characteristics of those who have requested some kind of assistance (usually a rehabilitative service) for their drug problem. These data have the advantage of relating to defined populations—e.g., all those who are "in treatment" in a given year—but have the disadvantage of examining *only* those whose drug usage has achieved proportions requiring or calling for some kind of external intervention.

Project DAWN

The Drug Abuse Warning Network (DAWN), a system sponsored jointly by the Drug Enforcement Administration (Department of Justice) and the National Institute on Drug Abuse, is designed to collect data on acute drug reactions (overdoses, suicide attempts, etc.) through emergency department and inpatient units of non-Federal, short-term general hospitals; county medical examiners; and crisis intervention centers not directly affiliated with colleges and universities. This effort has been in operation since 1972. DAWN was *not* designed to represent a definitive statement of current drug use. Rather, the system works in tandem with other measures to provide an additional perspective on drug use patterns. The most current reports from DAWN include data from 23 standard metropolitan statistical areas.

Some caveats are indicated in using DAWN data. DAWN records "drug mentions," meaning that the total number of drugs reported are recorded. Thus, if an individual is taking several different drugs, each drug will appear as an individual mention. Project DAWN also does not differentiate between the number of individuals that present themselves. Therefore, if a single person presents himself/herself due to drug-related problems several times in a year, the data will reflect this as several different cases. This is a particular problem intrinsic to data coming from drug crisis centers.

To supplement these data, a large emergency room study in Miami, Florida will be considered as a complement to the DAWN system. This research was conducted by the Division of Addiction Sciences in the University of Miami School of Medicine. In this effort—besides simply recording the usual DAWN demographics and drug mentions—an attempt was made to interview people presenting themselves in the emergency room of Jackson Memorial Hospital, the largest hospital in Dade County.

Below, the data coming from both sources will be presented. The DAWN data are summarized from Phase III, which represents a range of drug problems surfacing in 1975 and 1976. The Miami emergency room study is somewhat more extensive and presents some interesting trend data from 1973 and 1976.

Overview of Total DAWN System

During the 13-month period beginning in April 1975 and ending in April 1976, some 192,379 drug abuse episodes were reported. These separate episodes involved some 266,880 different drug mentions. The majority of these episodes and mentions (60 and 62 percent, respectively) occurred in hospital emergency rooms. Almost a third of the remainder were reported by crisis centers. Not unexpectedly, the demographic and social characteristics of persons using the different reporting centers (i.e., hospital emergency rooms as opposed to crisis centers) are different. The median age of the emergency room population was 26.9 years, while the median age of the crisis center client was 21.9 years. While 20-29 was the modal age for both, not surprisingly, the representation of persons 19 years old or younger was twice as great in the crisis centers reports as in the emergency rooms reports.

The distribution by race also varies between emergency rooms, crisis centers, and medical examiners. Limiting analysis to blacks and whites, the emergency rooms report a population of some 76 percent white and 21 percent black; the crisis centers report a white population of 79 percent and a black population of 18 percent. This distribution changes radically in the population reported by medical examiners. Here, the proportion of whites drops dramatically to 69 percent while the proportion of blacks rises to 27 percent. Each of these reporting centers varies by sex as well. Some 42 percent of those presenting themselves in an emergency were male, while 58 percent were female. These proportions are reversed in the crisis center population, where males are identified in 56 percent of the episodes and females involved in only 44 percent. In the medical examiner caseloads, some 63 percent are male versus 37 percent female. These distributions vary noticeably from the overall population projections which indicate that males constitute 48 percent and females constitute 52 percent of the nation's population. These demographic observations could be summarized by suggesting that (DAWN, 1975):

- The typical DAWN episode in an emergency room or crisis center involves a person who is younger than median age.
- If the report was provided by an emergency room or crisis center, a white was typically involved; if the report derived from a medical examiner, the episode likely involved a black.
- If the report derived from a crisis center or medical examiner, it was likely to involve a male; if the report came from an emergency room, it was likely to involve a female.

Drug Mentions

When the relative frequency of drug mentions are compared over the 21-month reporting period, a relatively consistent pattern emerges. Table 15 presents a rank order of these drugs by reporting period.

The 1974–75 data indicate that more than one-fourth (26 percent) of all drug mentions involved three drugs: diazepam, alcohol-in-combination, and heroin. The same ranking was reported for the earlier period; however, these drugs account for a

TABLE 15.—*Ranking of leading drugs of abuse—DAWN II and III project*

	DAWN III		DAWN II	
	(*n* = 266,880)		(*n* = 167,759)	
Drug	Rank	Percent of mentions	Rank	Percent of mentions
Diazepam	1	10	1	8
Alcohol-in-combination	2	8	2	7
Heroin	3	8	3	7
Marijuana	4	4	4	5
Aspirin	5	3	6	4
LSD	6	3	5	4
Secobarbital	7	3	7	3
d-Propoxyphene	8	2	12	2
Chlordiazepoxide	9	2	10	2
Methadone	10	2	9	2
Speed	11	2	11	2
Amphetamine	12	2	13	2
Flurazepam	13	2	19	1
Secobarbital/amobarbital	14	2	15	2
Methaqualone	15	1	8	2
Phenobarbital	16	1	17	1
Hashish	17	1	14	2
Cocaine	18	1	18	1
Pentobarbital	19	1	16	1
Amitriptyline	20	1	22	1
PCP	21	1	21	1
Morphine	22	1	23	1
Meprobamate	23	1	26	1
Codeine	24	1	32	1
Glutethimide	25	1	31	1

Source: National Institute on Drug Abuse, 1975b.

slightly smaller proportion (22 percent) of the total mentions. The actual ranking of most drugs reflects their relative popularity and availability.

A number of comparisons can be made over time. If all the reported drug mentions are roughly grouped in four classes—sedative/depressants ([barbiturate], nonbarbiturate sedative-hypnotics, opiates, other analgesics); stimulants; hallucinogens; and others (e.g., aspirin, inhalants)—the following distribution emerges:

	Reporting period 1973–74 (percent)	*Reporting period 1974–75 (percent)*
Sedatives/depressants	42	46
Stimulants	6	6
Hallucinogens	12	9
Others	4	3

These data suggest an increase in the relative representation of sedative/depressant drugs. A substantial part of this increase has derived from the increase in reports involving tranquilizers. Conversely, a decrease in the relative mentions of hallucinogens has occurred. This can either reflect an actual decrease in their use/availability *or* an increase in the sophistication of the population who uses them which would lessen the probability of unpleasant (especially panic) reactions.

Because DAWN collects data in sites across the nation, regional and SMSA distinctions are possible. The following differences have been highlighted (National Institute on Drug Abuse 1975b):

- Los Angeles, Detroit, and San Francisco provided almost half (48 percent) of total heroin mentions throughout the DAWN system. (These same cities provide only 29 percent of all drug mentions.)
- Two-thirds of all PCP mentions derive from Los Angeles, San Francisco, and Detroit.
- Hashish mentions from Detroit account for 31 percent of the total DAWN system reports for this drug. Three other SMSAs—Los Angeles, Atlanta, and Miami—provide an additional 32 percent of the total DAWN mentions.
- The New York SMSA accounts for 52 percent of the total DAWN mentions of methadone; methadone accounts for 18 percent of all drug mentions in New York.
- More than half (53 percent) of all speed mentions occur in Atlanta, Phoenix, and Minneapolis.
- Marijuana is ranked first in Washington, D.C. mentions, while 11 percent of all mentions in that city involve marijuana; marijuana accounts for only 4 percent of the total DAWN mentions. In this SMSA the aged 10–19 cohort accounts for 38 percent of mentions compared to 27 percent for the total DAWN system.

Here, the evident geographical differences reflect such factors as the changing drug marketplace, demographic shifts, and perhaps, regional fads.

Again, examining the drugs responsible for the DAWN episodes, it can be seen that more than one-fourth of the total mentions involved diazepam, alcohol-in-combination, or heroin. Characteristics of the persons presenting themselves with an acute reaction to these three drug mentions will be highlighted below.

DIAZEPAM

Diazepam is the Nation's leading minor tranquilizer. It is extensively prescribed by physicians for a wide variety of complaints (National Institute on Drug Abuse 1975b). Further:

- The majority of persons (57 percent) reported obtaining the drug through a legal prescription.
- Females are strongly overrepresented; more than two-thirds (70 percent) of users are female.
- More than four-fifths (88 percent) of the episodes were reported by hospital emergency rooms.
- More than half (51 percent) of the mentions indicated suicide as the motivation; this representation increased slightly to 55 percent if race is controlled for and only whites considered. Among blacks the suicide attempt/gesture accounts for 42 percent of the group.
- The majority (56 percent) of cases indicate that the drug was taken in combination with another substance.
- The majority (55 percent) of reports involved persons under the age of 29; among black females, almost half (49 percent) were between 20 and 29; only 38 percent of episodes involving white females occurred in this cohort. A similar pattern differentiating the races can be observed in the male cohort.

HEROIN

This drug was responsible for an excess of 20,000 DAWN mentions during 1975. While the majority of mentions (52 percent) were reported in hospital emergency rooms, a fairly substantial proportion (37 percent) were reported by crisis centers. Considering the social and demographic characteristics of these cases, the following distributions are reported (National Institute on Drug Abuse 1975b):

- In more than four-fifths (82 percent) of these cases, heroin was solely responsible for the episode.
- Not surprisingly, more than two-thirds (70 percent) report dependence; this is reported in a slightly greater proportion (72 percent) of the black than white (67.9 percent) E.R. mentions.
- The pursuit of psychic effects or suicide attempts/gestures were slightly more likely to be cited by whites.
- More than two-thirds (69 percent) of all cases were male.
- Both male and female cohorts exhibit a similar racial distribution—48 percent white and 29 percent black.
- Almost two-thirds (63 percent) of the reported cases are between the ages of 20 and 29. When race and sex are considered independently, these data suggest that white males tend to be *younger* than blacks. Seventy-eight percent of the whites are under age 29, while only 70 percent of the blacks are under that age; 19 percent of the black males were between 30 and 39, while only 13 percent of the whites are in this cohort.
- Only a small proportion (14 percent) report being employed, while 45 percent report being unemployed.

DAWN Summary

Diazepam, heroin, and alcohol-in-combination account for some 26 percent (N = 69,084) of the DAWN III mentions. In most of the 23 SMSAs, these three drugs are the most prevalent. The social and demographic characteristics of each tend to reflect the larger population of regular users of these drugs—e.g., male overrepresentation in drinkers, female overrepresentation in the population of tranquilizer users, and sociological differences in the heroin users. In each of the three populations, the 20- to 29-year-olds exhibit the greatest statistical risk of having a negative drug reaction. And, with the exception of heroin, suicide attempts/gestures appeared to motivate a substantial portion (34 percent for alcohol and 51 percent for diazepam) of these acute drug reaction cases.

The Miami Study

An intensive study of persons experiencing an acute drug reaction was undertaken in Miami, Florida. In many ways similar to DAWN, it endeavored to examine the same problem population more fully (Inciardi et al. 1978). The hospital in which the data was collected was a DAWN data collection site as well. While the Miami research was not as comprehensive as was hoped for, the clarity and longitudinal consistency of the data make it worth detailed examination.

The Miami data is reasonably comparable to the larger DAWN effort. Similar reaction patterns such as the preponderance of alcohol-in-combination and diazepam have been documented elsewhere. (The base population of Dade County, however, is *not* typical of other areas of the nation; a substantial proportion—24 percent—of the metropolitan Dade County is Hispanic, primarily Cuban.)

Between 1972 and 1976, some 11,287 drug emergency cases/patients were documented in Miami. The majority of these were females and heavily clustered in the 18- to 37-year age cohort. An analysis of the drugs reported to have precipitated the incidents suggests that legally manufactured and distributed drugs have maintained a majority position through the half decade; however, some change clearly has been and is occurring. In 1972 some 41 percent of all reported reactions involved central nervous system depressants. This proportion has steadily declined from a high point of 42 percent in 1973 to its current low (in 1976) of 33.5 percent of all cases. While the proportion of negative reactions to tranquilizers has increased over the period, the overall decrease in CNS depressant cases has occurred through the gradual decline of sedatives and hypnotics which likely reflect the tightening of controls on their sale and distribution (Inciardi et al. 1978).

The distribution of heroin-related incidents exhibits a considerable amount of variability. In 1972, 12.6 percent of the cases involved heroin; this proportion declined to 7.7 percent in 1973 and then surged to 14 percent in 1976. This may well reflect on the growing prominence of Miami as a port of entry for illicit drugs (especially heroin, cocaine, and marijuana).

In addition to alterations in the patterns of drug use, the overall sexual distribution of the population is changing to include more males. For example, in 1972 only 35 percent of the patients presenting with an adverse reaction to a major tranquilizer were male. By 1975, however, this proportion had increased to 54.4 percent. A similar shift can be observed in the minor tranquilizers, barbiturates, and nonbarbiturate sedatives (Inciardi et al. 1978).

Intensive Interviews

In the fourth year of the research, an attempt was made to accumulate detailed information on these drug emergency patients. An instrument which would elicit data on social and personal characteristics, drug use and treatment history, arrest history, and other data relevant to deviant behavior was devised. Of the approximately 4,000 acute drug reaction patients and approximately 5,000 alcohol reaction patients, only 309 and 217, respectively, were interviewed. No systematic sampling procedure was used. Instead, the willingness and availability of the patient and the availability of an interviewer determined whether an interview would be completed. Nevertheless, the authors of the Miami study are essentially comfortable with the findings and feel that they adequately reflect the characteristics of the more serious acute cases.

Regardless of the specific substance (or substances) responsible for the acute drug reaction incident, these clients represent the more serious cases. Specifically, this population could be described (Inciardi 1977) as:

- Having no more than a high school education; and, in many cases, lacking even this level of attainment;
- Currently receiving or recently having received some kind of public assistance;
- Living in some arrangement other than married, living with spouse;
- Unemployed at the time of the interview;
- Of blue collar status, most commonly an unskilled worker;
- Having involvement in multiple substance use; and
- Having previous or ongoing involvement with the criminal justice system.

On the basis of the primary drug responsible for the incident, four large subpopulations were identified: They include patients needing treatment for (1) alcohol; (2) sedatives; (3) narcotics; and (4) minor tranquilizer reactions. Of these four, the minor tranquilizer subpopulation was *least* likely to fit the general sociological description offered above. This was particularly true along the dimensions of criminal involvement and multiple substance use. Tranquilizer users tended to be older and white (and/or Hispanic).

ALCOHOL GROUP

Characterization of the alcohol subpopulation encompasses a number of methodological and conceptual difficulties. The interviewers stationed in the hospital were instructed to record data on any patient involved with alcohol. Consequently, conditions other than intoxication or alcohol and other drug reactions were included. Because of the severity and variety of problems likely to force a drinker into a medical setting, the alcohol subpopulation is reminiscent of a "skid row" group. There was, for instance:

- An overwhelming proportion of whites;
- A predominance of males;
- An excess of persons having a history of multiple arrests, presumably for alcohol related offenses such as public intoxication; and
- A number of older persons; while 70 percent of the alcohol population is 35 years old or older, only 21 percent of the drug group are over 35.

SEDATIVES GROUP

Demographically, the population of patients with adverse reactions in which a sedative type drug was implicated (table 16) could be differentiated from the other groups as being:

- More racially homogeneous (more than four-fifths (81 percent) of this group was white);
- Also predominated by males (58 percent); and
- Having a higher concentration of younger people than either the narcotics or tranquilizer group (53 percent of this group was 24 years old or younger).

This subpopulation was described as being a "cross between the narcotics and minor tranquilizer groups" (Inciardi et al. 1978).This gives rise to the hypothesis that this population includes both *older* whites (especially women) exhibiting lower multiple drug and criminal involvement, and *younger* persons (especially white males) who exhibit typical (street) multiple use patterns and who are as criminally involved as many in the narcotics group.

NARCOTICS GROUP

The narcotics group distinguishes itself from the other drug populations by:

- Having the highest (almost 50 percent) representation of blacks;

TABLE 16.—*Demographic characteristics of Miami emergency room drug reaction patients—for 3 drug subgroups*

Demographic characteristics	Minor tranquilizers (n = 47)		Sedatives (n = 78)		Narcotics (n = 58)	
	n	Percent	n	Percent	n	Percent
Age:						
17 and under	4	8.5	4	5.1	0	0
18–24	15	31.9	37	47.4	21	36.2
25–34	15	31.9	25	32.1	32	55.2
35–49	8	17.0	9	11.5	4	6.9
50 and over	5	10.6	3	3.8	1	1.7
Total	47	99.9	78	99.9	58	100.0
Sex:						
Male	21	44.7	45	57.7	31	53.4
Female	26	55.3	33	42.3	27	46.6
Total	47	100.0	78	100.0	58	100.0
Ethnicity:						
White	32	68.1	63	80.8	26	44.8
Black	4	8.5	6	7.7	28	48.3
Hispanic	9	19.1	9	11.5	3	5.2
Other	2	4.3	0	0	1	1.7
Total	47	100.0	78	100.0	58	100.0

Note: Alcohol has been excluded from this table.
Source: Inciardi et al. 1978.

- Being the youngest group, when considered in aggregate;
- Being both the most criminally and multiple drug involved.

In summary, the findings of this study show both similarity and divergence from the larger DAWN patterns. Most of the drug reaction patients come to the emergency room because of a negative reaction involving legally manufactured and distributed drugs. These data are equally clear, however, in suggesting that illegal drugs are responsible for a greater proportion of emergency room contacts than in most other cities in the DAWN system (Inciardi et al. 1978).

While Miami may be somewhat atypical (because of its emergence as a significant entry and distribution point for illegal drugs) the suggested population profiles point to noticeable differences in drug usage. The observed changes in median age and sex may portend a series of alterations that will emerge in other areas.

CODAP Data Base

DAWN and complementary efforts have focused on those experiencing a medical (including psychologic) crisis involving drug use/abuse. A large amount of data on drug users is available through reports provided by drug treatment programs. The Client Oriented Data Acquisition Process (CODAP) collects data on the sociological and demographic characteristics of clients receiving treatment at all federally supported drug programs. Reports are received from approximately 1,800 different treatment units. CODAP is designed for neither extrapolation nor for the definitive study of incidence or prevalence. Its data represents a profile of a particular population: those who find it necessary or advantageous to enter treatment for a drug problem. Like DAWN and criminal justice data, it lacks information on people who initiate (and presumably continue) drug use but avoid any official institutional contact; however, only survey data avoids this problem (Sample 1977b).

Primary Drug Use

Since many persons use a large number and variety of psychoactive drugs, some determination of the relative magnitude of individual drug problems must be made. The primary drug problem, according to CODAP, is abuse of that drug which is primarily responsible for the client's dysfunction; it constitutes the problem for which the client was admitted to treatment. Secondary and tertiary drug problems are responsible for correspondingly lesser dysfunction (National Institute on Drug Abuse

TABLE 17.—*Primary drug at admission by year of admission, in percent*

Drug	1976	1975	1973–1974
None	2.0	3.0	1.0
Heroin	62.4	60.2	62.0
Illegal methadone	0.6		
Other opiates	2.1		
Alcohol	7.1	8.3	4.0
Marijuana	8.7	12.9	16.0
Barbiturates	4.5	3.9	6.0
Other sedatives	2.7		
Amphetamines	4.5	4.7	
Cocaine	1.2		1.0
Hallucinogens	2.4		
Inhalants	1.2	7.0	10.0
Over-the-counter	0.2		
Other	0.4		
Number	224,514	208,172	149,342

Source: National Institute on Drug Abuse, CODAP data, 1973-1976.

1976). The distribution of primary drug problem over time is depicted in table 17.

These data present a mixed picture. The proportion of people seeking treatment for a narcotics problem has remained stable for the 4-year period; almost two-thirds of the treatment population are admitted with a narcotic as the primary drug of abuse.

While one might consider the significant drop—almost 50 percent—in the proportion of persons presenting with a marijuana primary drug problem as indicative of a decline in its use/availability, another explanation is more plausible. With the increase in the popularity of marijuana and the subsequent move toward large-scale decriminalization, the marijuana user is less likely to be moved into treatment via criminal justice system contact. Then too, the amount of knowledge currently available about the drug might help to keep people "out of trouble" by establishing reasonable psychobehavioral expectations.

While the representation of sedative-type drugs (especially barbiturates) has remained reasonably consistent over the 4-year period, recent data suggest that this sould be monitored as an emerging problem. In 1976, 14.3 percent reported a sedative-type drug (including alcohol) as their primary problem.

The data on alcohol as the primary drug are somewhat more ambiguous. The fluctuation of the 4-year period probably represents the recognition, by parts of the treatment system, that alcohol indeed has a potential for abuse and its treatment should be addressed in a "drug program"—at least one tied into the CODAP system. We do know that (1) a majority of drug users do drink; and (2) alcohol is likely to be the first drug abused. These factors are likely to become increasingly significant for those presenting with an alcohol problem.

Regional Differences

Like the DAWN and prescription psychoactive data, CODAP data suggest some regional differences. The distribution in table 18 is based on a State-by-State analysis (National Institute on Drug Abuse 1976).

These data are clear in their implication that the proportion of persons reporting heroin as their primary drug is highest for the Western region and

TABLE 18.—*Primary drug use at admission by region (1976), in percent*

Drug	North Central	Northeast	South	West	Total
Heroin	66.2	64.1	48.1	71.4	62.4
Illegal methadone	0.2	1.4	0.4	0.1	0.6
Other opiates	2.2	3.5	3.4	1.5	2.1
Alcohol	4.6	7.2	12.0	4.5	7.1
Marijuana	6.4	6.9	13.1	7.9	8.7
Barbiturates	8.1	6.0	9.7	5.8	7.2

lowest for the Southern. Interestingly, when the primary problem involves alcohol the distribution completely reverses itself, with the highest proportion emerging in the Southern region and the lowest reported by the Western region. Furthermore, the Southern region distinguishes itself by reporting marijuana, barbiturates, and other sedatives as the primary problems. If the regional data is examined on State-by-State basis some differences do arise:

- In the Northeastern region, New Jersey, New York, and Pennsylvania are responsible for 85 percent of the primary heroin reports.
- Approximately half of the alcohol reports derive from New York programs.
- Not surprisingly, the distribution from the North Central region is strongly influenced by concentrations in Michigan and Illinois.
- Missouri reports the largest concentration (29 percent) of primary alcohol problems in the region.
- In the Southern region, Florida reports the single highest (17 percent) proportion of primary heroin problem.
- Almost half (47 percent) of the Southern region's alcohol admissions are reported by Tennessee.
- In the Western region, California programs account for roughly two-thirds of the region's clients.
- Arizona presents the second highest proportion of primary heroin reports.
- A substantial proportion (over 20 percent) of the primary alcohol problems are reported out by program in the State of Washington.

While these data are suggestive of both regional and State differences, any conclusions concerning incidence and prevalence are problematic. Social norms surrounding drug use, availability and access of programs, and relative demographics are powerful explanatory devices when these CODAP-derived data are considered.

When the demographic characteristics of persons who entered treatment in the preceding year are analyzed by primary drug, the distributions presented in tables 19 and 20 emerge:

- Heroin is the primary drug of abuse for 45 percent of the whites, 82 percent of the blacks, and 78 percent of the Hispanic clients.
- When age is considered, the overwhelming proportion of persons in the age cohorts encompassing 21 to 44 years report heroin is their primary drug. In persons in the older cohort (over 44) the representation of heroin and alcohol is roughly equal. Marijuana and inhalants are the modal drugs for persons under 18. Some 39 percent of this cohort report marijuana as the primary drug; more than half (58 percent) of the inhalant clients are under 18.
- Males are overrepresented in the CODAP reporting system and constitute almost three-fourths (74 percent) of the population. When these data are somewhat expanded, this predominance holds for all of the opiate drugs and alcohol, cocaine, marijuana, hallucinogens, and inhalants; the strongest representation occurs in the alcohol and inhalant subpopulation where more than four-fifths (83 percent and 85 percent respectively) are male. The representation of females increases noticeably in the barbiturate, other sedative, amphetamine, and over-the-counter subpopulations; the strongest representation, however, occurs in the other sedative group where males and females are almost equally distributed.

The primary drug subpopulations vary somewhat along selected social dimensions. Consider the following (National Institute on Drug Abuse 1976):

- Unemployment is the norm in each of the subpopulations. The representation of unemployed persons holds at around 75 percent; not surprisingly, the "most employed" subpopulation is the marijuana group where "only" 75 percent are unemployed; the employment status of the other sedative and over-the-counter subpopulations falls between the marijuana and other primary drug groups.
- Most of the clients (83 percent) were in treatment voluntarily. Interestingly, the greatest proportion of clients legally remanded to treatment occurred in the cocaine (35 percent) and the marijuana (33 percent) subpopulations.
- The treatment population divides itself fairly evenly on the dimension of education; however, a slight majority of clients (52 percent) reports less than a 12th-grade education. As the marijuana group has the greatest proportion (69 percent) of people not completing high school, the relative youth of this subpopulation is a likely explanation here.

In summary, these demographic and sociologic data extracted from CODAP support the hypothesis advanced for other intervention data that there are

TABLE 19.—*Primary drug at admission by race/ethnicity, age at admission, and sex, in row percentages*

Demographic characteristics	Primary drug at admission								
	Heroin	Other opiate	Alcohol	Mari-juana	Barbi-turate	Amphet-amine	Cocaine	Other	Total *n*
Race/ethnicity:									
White	45.2	4.1	10.2	12.2	7.1	7.5	1.3	12.3	122,413
Black	81.6	1.3	4.4	4.5	1.6	1.4	1.2	4.1	88,294
Hispanic	78.2	1.1	2.4	6.9	2.2	1.2	0.9	7.2	29,930
Other	47.2	2.1	10.4	12.0	8.5	4.5	1.7	13.5	3,248
Age at admission:									
Less than 18	4.5	1.2	8.1	38.9	10.4	8.7	1.4	26.7	23,062
18–20	37.7	2.5	4.7	19.2	9.5	8.9	2.4	15.2	27,322
21–25	71.9	2.9	3.0	5.9	4.3	4.5	1.3	6.3	77,388
26–30	79.4	2.8	3.8	3.0	2.5	3.0	1.0	4.6	62,678
31–44	72.7	3.0	11.6	1.5	2.2	2.5	0.8	5.8	42,418
Greater than 44	41.0	3.9	41.2	0.6	2.5	1.0	0.3	9.6	11,089
Sex:									
Male	63.3	2.7	8.0	8.7	4.1	4.1	1.3	7.8	181,244
Female	59.7	2.8	4.6	8.8	5.7	5.5	0.9	11.9	62,379
All clients	62.4	2.7	7.1	8.7	4.5	4.5	1.2	8.9	244,514

Source: National Institute on Drug Abuse, CODAP data, 1976.

differences that do distinguish the users of specific kinds of drugs.

Drug Use Patterns

In addition to differences correlated with demographic and sociologic characteristics, these drug treatment subpopulations vary in relation to their drug-related behavior. When the frequency of drug use is considered, certain distributions emerge (as indicated in table 21).

- At admission, frequency of use by heroin users suggests a bimodal distribution. While most (73 percent) report daily use, a noticeable proportion indicate no present use.
- A similar pattern, though not as clearly defined, exists for the "other opiate" subpopulation. In this group, the proportion reporting no present use is similar to the heroin group, but there is wider distribution of occasional use.
- Alcohol is the only other primary substance which a substantial proportion (49 percent) of the clients report using daily. This would suggest that the drinking behavior is organized into a pattern of regular rather than episodic (bender or binge) inebriation.

TABLE 20.—*Selected characteristics of CODAP clients by primary drug (1976)*

Drug	Sex		Age					Race		
	M	F	0–17	18–20	21–25	26–30	31+	White	Black	Other
Heroin	75.3	24.7	0.7	6.8	36.6	32.7	23.2	36.3	47.3	16.4
Illegal methadone	77.1	22.9	1.9	9.0	41.9	29.9	17.4	59.0	28.6	12.4
Other opiates	72.1	27.9	4.7	10.6	31.1	25.6	27.9	81.8	13.9	4.3
Alcohol	83.3	16.7	10.8	7.4	13.5	13.7	54.6	71.8	22.1	6.1
Barbiturates	67.7	32.3	21.5	23.4	30.1	14.2	10.8	78.7	12.9	8.4
Other sedatives	51.0	49.0	18.1	16.2	27.7	15.2	28.7	85.4	9.9	4.7
Amphetamines	68.1	31.9	18.5	22.3	31.7	17.0	10.6	84.3	11.2	4.6
Cocaine	80.4	19.6	11.4	22.1	33.3	20.7	12.5	52.4	36.9	10.7
Marijuana	74.0	26.0	42.0	24.6	21.3	8.7	3.4	70.1	18.5	11.4
Hallucinogens	73.7	26.3	32.4	29.8	26.5	8.6	2.8	83.4	10.0	6.5
Inhalants	84.9	13.1	58.2	20.6	15.0	4.9	1.3	53.0	5.4	41.6
Over-the-counter	54.3	45.7	22.0	12.0	22.2	18.0	25.9	77.4	16.6	6.0
Other drugs	69.8	30.2	12.5	16.8	32.6	20.2	18.0	74.1	16.0	9.9

Source: National Institute on Drug Abuse, CODAP data, 1976.

TABLE 21.—*Primary drug at admission by selected drug abuse characteristics, in column percentages*

Drug abuse characteristics	Primary drug at admission								
	Heroin	Other opiate	Alcohol	Marijuana	Barbiturate	Amphetamine	Cocaine	Other	All clients
Frequency of use:									
No present use	19.0	18.3	17.1	15.6	25.1	31.3	38.0	22.0	19.9
Less than once/week	2.0	5.5	6.5	12.6	11.8	12.8	13.7	16.1	5.4
Once/week	1.5	2.8	7.6	13.6	9.3	9.3	9.1	11.1	4.5
Several times/week	4.2	9.2	19.9	30.2	23.6	21.1	19.2	21.5	10.9
Daily	73.3	64.2	48.9	27.9	30.2	25.6	20.0	29.3	59.4
Total, *n*	151,940	6,565	17,303	21,286	11,072	10,857	2,906	16,614	238,543
Age at first use:									
Less than 14	3.6	3.5	21.7	29.1	15.3	12.1	7.0	17.8	9.1
14–15	9.8	7.4	20.5	30.9	24.7	22.0	15.0	22.7	14.6
16–17	18.9	13.0	18.1	19.0	20.7	22.2	20.3	17.5	18.9
18–19	22.8	16.8	13.4	10.3	14.5	16.6	19.6	11.7	19.4
20–21	17.5	14.7	8.3	5.1	8.0	10.0	12.3	7.0	14.1
22–23	10.8	11.7	3.9	2.4	5.0	6.2	8.9	5.1	8.7
24–25	6.6	8.8	2.8	1.3	3.2	3.6	6.1	3.6	5.4
26–30	7.0	11.9	4.3	1.3	4.1	4.4	7.2	5.9	6.1
Greater than 30	3.0	12.2	6.9	0.8	4.5	2.8	3.6	8.5	3.8
Total, *n*	151,190	6,472	17,225	21,122	11,040	10,816	2,869	16,496	237,230

Source: National Institute on Drug Abuse, CODAP data, 1976.

TABLE 22.—*Primary drug by secondary and tertiary drug at admission (in row percentages)*

Primary drug	Secondary drug[1]									Total *n*
	None	Heroin	Other opiate	Alcohol	Marijuana	Barbiturate	Amphetamine	Cocaine	Other	
Heroin	71.0	0.0	4.9	3.6	8.2	3.1	1.4	6.0	1.8	152,331
Other opiates	53.3	15.7	2.0	3.8	5.7	7.2	3.0	1.4	7.9	6,590
Alcohol	77.6	1.7	0.4	0.0	12.3	2.4	1.8	0.3	3.5	17,404
Marijuana	58.5	1.1	0.3	25.6	0.0	3.6	3.8	1.2	5.8	21,364
Barbiturates	39.6	3.0	2.2	10.3	18.5	0.0	10.5	1.9	13.9	11,111
Amphetamines	43.8	2.5	1.0	9.1	21.6	9.2	0.0	2.3	10.5	10,894
Cocaine	47.5	6.8	1.2	4.8	21.5	5.7	6.1	0.0	6.5	2,926
Other	43.5	1.4	1.3	10.5	23.5	5.7	5.5	1.3	7.2	17,134
All clients	65.0	1.1	3.5	6.4	10.0	3.5	2.4	4.3	3.9	239,754
	Tertiary drug[2]									
	None	Heroin	Other opiate	Alcohol	Marijuana	Barbiturate	Amphetamine	Cocaine	Other	Total *n*
Heroin	85.8	0.0	1.2	2.0	5.7	1.7	0.8	1.6	1.2	152,202
Other opiates	75.4	1.6	1.1	3.9	6.0	3.6	2.3	1.3	4.8	6,573
Alcohol	92.2	0.4	0.3	0.0	2.2	1.3	1.5	0.3	1.8	17,389
Marijuana	86.7	0.6	0.2	3.8	0.0	2.3	2.1	1.0	3.2	21,323
Barbiturates	59.7	1.4	1.2	11.3	14.5	0.0	3.8	1.6	6.5	11,090
Amphetamines	62.9	1.0	0.7	10.5	15.3	2.9	0.0	1.2	5.4	10,882
Cocaine	64.1	1.6	0.9	8.5	13.7	3.8	3.2	0.0	4.2	2,926
Other	65.8	0.6	0.5	10.4	12.1	2.2	2.7	0.7	5.1	17,100
All clients	82.1	0.3	0.9	3.6	6.3	1.8	1.3	1.4	2.3	239,485

[1] Clients are shown as abusing a secondary drug only if the frequency of abuse of the secondary drug is once per month or greater.

[2] Clients are shown as abusing a tertiary drug only if the frequency of abuse of the tertiary drug is once per month or greater.

Note—Clients having no primary drug problem are excluded.

Source: National Institute on Drug Abuse, CODAP data, 1976.

When age at first use is considered, other patterns emerge:

- Overall, some 43 percent of the treatment population used their primary drug before age 18; if the age is extended to 19, almost two-thirds (62 percent) of the treatment population had experience with that drug.
- Almost four out of five (79 percent) of the marijuana clients used this drug before age 18; these persons present the earliest age of first use.
- Not unexpectedly, the alcohol clients report a similarly young age at first use.
- Only one-third (32 percent) of the heroin clients experienced first use before age 18.
- Most primary barbiturate clients (61 percent) and amphetamine clients (56 percent) report initial use before age 18.

These data encourage a number of interpretations. Alcohol and marijuana, the two most common psychoactive drugs, seem to be used at a relatively early age; this pattern prompts the speculation that ready accessibility encourages youthful use. Conversely, the more difficult it is to obtain a drug, the older an individual is before s/he experiments with it for the first time.

Multiple Drug Abuse

In addition to the data collected concerning age at first use, CODAP gathers information on concurrent drug use. Two extrapolations were made from this data: "secondary drug use" and "tertiary drug" use. CODAP specifies, that in order for a drug to achieve one (or both) of these designations, it must be used at least once per month. Table 22 displays these drug use patterns.

- The majority (65 percent) of clients report no additional drug of abuse; this statistic goes from a high of 78 percent among alcohol clients to a low of 37 percent among barbiturate clients.
- Among the marijuana clients, slightly more than one-fourth (26 percent) were abusing alcohol.
- Alcohol and marijuana are the two drugs most likely to be mentioned as "secondary" or "tertiary" drugs of abuse.

Table 23 displays the most frequent drug combinations reported by CODAP clients. These data are clear in their suggestion that marijuana is the single drug most likely to be abused along with any primary drug.

TABLE 23.—*CODAP clients: common drug combinations*

Drug combinations	Number	Percent of admission by primary drug
Heroin and marijuana	12,491	8.2
Other opiates and heroin	1,034	15.7
Alcohol and marijuana	2,140	12.3
Marijuana and alcohol	5,469	25.6
Barbiturates and marijuana	2,055	18.5
Amphetamines and marijuana	2,353	21.6
Cocaine and marijuana	629	21.5
Other and marijuana	4,026	23.5

Source: National Institute on Drug Abuse, CODAP data, 1976.

The overall proportion of 65 percent of the CODAP admissions claiming *not* to have a secondary drug problem appears high. A number of interpretations might be offered. While misrepresentation is always a possibility, it is likely that the difficulty resides in adequately reporting regular secondary drug use, which is not necessarily perceived as a drug problem. This would particularly be the case with alcohol since it is a legal drug (as opposed to many other abused agents). Even though intoxication may occur frequently, the abuse of alcohol often escapes recognition. Going beyond CODAP, it is not unreasonable to assume that those about to enter treatment for their drug abuse problems concurrently use a large number of psychoactive drugs (including alcohol) and treatment statistics are *not* registering the extent and intensity of this use.

GENERAL POPULATION EPIDEMIOLOGIC DATA

General population surveys offer the best measure of the incidence and prevalence of a phenomenon. If the study employs a rigorously drawn probability (random) sample, it is possible to project the findings to the larger population. Yet, drug research still presents a number of problems not normally found in other surveys. Some of these will be briefly discussed below.

When dealing with a phenomenon such as drug abuse, it is unlikely that the persons most profoundly affected will be reached through general population research. Because these surveys necessarily concentrate on persons living in households, those whose drug use has made them socially dysfunctional are unlikely to be contacted. Too, persons living away from home—out of state at college, incarcerated, in treatment, transient, etc.—are not likely to be reached. Many of these, because of current lifestyles, may be most at risk for drug use; surveys which miss these individuals will, therefore, underreport certain kinds of behavior.

The question of the reliability and validity of drug survey data must always be raised. As survey researchers we have to assume that the respondent is telling the truth. While checks of internal validity are imposed and interviewers are adequately trained to assure rapport and perhaps recognize a respondent who is fabricating his/her history, there is still no absolute way of insuring the truth of what is recorded. Too, respondents may be mistaken about their drug use—assuming that they took a given substance when, in fact, the substance was something entirely different; or, simply forgetting their habits of use. Lastly, the question of response rate is being increasingly raised. While we do not as yet know how strongly the response rate has influenced our survey projections, we do know that it has been steadily declining over the last decade (Cisin 1977).

A number of different surveys will be reported on in this section. They include: findings about a sample of high school seniors (Johnston 1976); large-scale surveys conducted by the Social Research Group of George Washington University, in conjunction with the Response Analysis Corporation of Princeton, New Jersey (Abelson and Fishburne 1976); and a research study focusing on the use of drugs by young men (O'Donnell et al. 1976).

Non-Medical Use of Psychoactive Substances

The research studies undertaken for the past several years by the Social Research Group in conjunction with the Response Analysis Corporation represent a trend in general population research begun by the National Commission on Marijuana and Drug Abuse in the early 1970s. As such, they are extremely valuable because they remain comparable over time and can therefore provide some trend data. As in earlier studies, the 1975-76 survey collected data by means of a nationwide probability-based sample, involving in-the-home personal interviews. The interviews were distributed as follows: in the 12 to 17 year age group, approximately 1,000 interviews; in the 18 to 34 year age

TABLE 24.—*Experience with 12 types of drugs, by all youth and all adults: trends in prevalence, 1972, 1974, and 1975/76*

Drug	Ever used (in percent)					
	All Youth: age 12–17			All Adults: age 18+		
	1972	1974	1975/6	1972	1974	1975/6
	(880)	(952)	(986)	(2,411)	(3,071)	(2,590)
Marijuana	14	23	22	16	19	21
Hashish	(1)	10	10	(1)	9	9
Glue, other inhalants	6	9	8	2	3	3
LSD, other hallucinogens	5	6	5	5	5	5
Cocaine	2	4	3	3	3	4
Heroin	1	1	1	1	1	1
Methadone	(1)	1	1	(1)	1	1
Other opiates	(1)	6	6	(1)	3	5
Nonmedical use, psychotherapeutic drugs	(2)	10	11	(2)	13	15
Any Rx	6	7	8	10	7	11
Sedatives	3	5	3	4	4	4
Tranquilizers	3	3	3	6	3	4
Stimulants	4	5	4	5	6	8
Over-the-counter	6	6	6	7	8	6

[1] Not included in 1972 study.
[2] Not tabulated in 1972 study.
Source: U.S. Department of Health, Education and Welfare, 1976.

TABLE 25.—*Lifetime prevalence: young adults aged 18-25 (29,829,000 projected)*

Drug	Percent	Projected number
Marijuana	52.9	15,780,000
Hashish	29.2	8,710,000
Glue, other inhalants	9.0	2,685,000
LSD, other hallucinogens	17.3	5,160,000
Cocaine	13.4	3,997,000
Heroin	3.9	1,163,000
Methadone	2.3	686,000
Other opiates	14.0	4,176,000
Nonmedical	25.5	7,606,000
Psychotherapeutic drug use:		
Any Rx	22.0	6,562,000
Sedatives	11.9	3,550,000
Tranquilizers	9.1	2,714,000
Stimulants	16.6	4,952,000
Over-the-counter	11.5	3,430,000

Source: Abelson and Fishburne 1976.

group, approximately 1,700 interviews; and, in the 35 and above age group, approximately 850 interviews. As in similar surveys, the sample was disproportionately stratified (i.e., the numerically largest population cohort did not get the greatest number of interviews); this methodology was used to maximize the data input from that cohort(s) believed to be most seriously involved in the phenomenon. Appropriate statistical weights were then applied to make the sample reflect the large (unbiased) population.

Prevalence

When lifetime prevalence ("ever used") is considered, the distribution presented in table 24 emerges. The general usage pattern suggests that marijuana and the other cannaboids have the greatest prevalence of use. If alcohol is considered, then it becomes the drug most often used, with more than two-thirds (70 percent) of the population reporting its use at one time. Ranking second to marijuana and alcohol is the use of the prescription psychotropics, presumably without the supervision of a physician.

It seems, then, that a measure of stability has been achieved; while illegal drug use has not ceased, its rate of increase (prevalence within the population) appears to have leveled off. In the 12 to 17 year cohort, the prevalence of all drug use has either declined or remained stable between the 1974 survey and 1975/76 efforts; the dramatic increase between 1972 and 1974 seems to have been contained (Abelson and Fishburne 1976).

The 18 to 25 year cohort is the age group in which drug use is most likely to occur. If this cohort is examined, its drug prevalence data (table 25) demonstrate a significantly greater distribution (Abelson and Fishburne 1976).

In the oldest cohort, aged 26 and above, the lifetime prevalence drops dramatically (see table 26). Marijuana, the most commonly mentioned drug, declines from its 53 percent prevalence figure among 18- to 25-year-olds to 13 percent in this older cohort. Declines are dramatic for other drugs as well (Abelson and Fishburne 1976).

TABLE 26.—*Lifetime prevalence by drug, age cohort and race, in percent*

	12–17		18–25		26 and above	
Drug	White	Nonwhite	White	Nonwhite	White	Nonwhite
Marijuana	22.3	21.7	54.8	48.1	12.4	16.7
Hashish	9.0	8.1	32.3	15.0	4.1	5.0
Glue, inhalants	8.6	2.9	8.9	8.8	2.0	(1)
LSD, hallucinogens	4.8	1.0	19.4	7.9	1.7	1.0
Cocaine	2.6	3.4	14.5	9.1	1.4	3.1
Heroin	(1)	(1)	4.0	2.3	(1)	0.7
Methadone	(1)	(1)	3.0	(1)	(1)	1.6
Other opiates	5.8	3.6	14.3	13.6	2.7	3.8
Nonmedical use of psychotherapeutic drugs	10.5	8.9	25.8	22.4	12.4	8.4
Any Rx	7.8	3.5	23.2	14.4	8.9	4.9
Sedatives	3.0	(1)	12.3	7.6	2.6	1.5
Tranquilizers	3.3	2.6	9.3	7.2	2.5	1.6
Stimulants	4.7	1.3	18.4	6.6	5.9	3.1
Over-the-counter	5.6	5.3	11.0	14.1	5.0	4.5

[1] Less than 0.5 percent.

Source: Abelson and Fishburne 1976.

TABLE 27.—*1976 household survey: current drug use by age and sex, in percent*

	12–17 •			18–25			26 and above		
	n (projected) = 25,109,000			*n* (projected) = 29,829,000			*n* (projected) = 115,359,000		
Drug	Male	Female	Total	Male	Female	Total	Male	Female	Total
Marijuana	14.1	10.6	12.3	30.6	19.4	25.0	5.6	1.6	3.5
Hashish	2.7	2.9	2.8	6.9	4.1	5.6	0.5	(1)	(1)
Glue, other inhalants	1.2	0.5	0.9	0.7	(1)	0.5	(1)	(1)	(1)
LSD, other hallucinogens	1.6	(1)	0.0	1.6	0.7	1.1	(1)	(1)	(1)
Cocaine	1.2	0.8	1.0	2.6	1.2	2.0	(1)	(1)	(1)
Heroin	0.5	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Methadone	0.6	(1)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Other opiates	3.2	1.4	2.3	1.4	1.1	1.3	(1)	(1)	(1)
Nonmedical use of psychotherapeutic drugs	2.4	1.5	2.0	8.7	7.7	8.2	2.1	1.6	1.8
Any Rx	2.1	1.3	1.7	7.0	6.6	6.8	1.5	(1)	1.0
Sedatives	(1)	(1)	(1)	2.3	2.2	2.3	0.6	(1)	0.5
Tranquilizers	1.5	0.7	1.1	3.0	2.2	2.6	0.7	(1)	(1)
Stimulants	1.1	1.1	1.2	5.1	4.3	4.7	0.5	(1)	(1)
Over-the-counter	0.7	0.8	0.8	3.3	1.6	2.5	0.9	1.1	1.0

[1] Less than 0.5 percent.

Source: Abelson and Fishburne 1976.

Current Use

When *current* prevalence patterns are considered, a somewhat similar distribution emerges. Consider the age and sex distribution illustrated in table 27.

- Drug use is associated with sex; in each drug category there is a greater proportion of male than female users.
- Young adults aged 18 to 25 are the greatest consumers of these illicit psychotropic drugs. One-fourth of this cohort reported (i.e., was projected) use of marijuana in the month preceding the interview. When sex is controlled for, this proportion increases to almost one-third (31 percent) of the males who report recent usage.
- Young adults are also the most frequent consumers of alcohol. More than two-thirds (69 percent) of this cohort reported (some) drinking in the month preceding the interview. The proportion of recent alcohol use varied from one-third (32 percent) of the 12- to 17-year-olds, to more than half (56 percent) of persons over age 26.

These lifetime and current prevalence drug use statistics seem to be associated with the factor of race. The influence, however, is inconsistent; it is difficult to determine whether whites use drugs more often than blacks.

Among both groups, age appears to be the most reliable predictor of use. Among marijuana users, the frequency distribution among 12- to 17-year-olds is similar between whites and nonwhites. In the young adult cohort, more whites (55 percent) than nonwhites (48 percent) report ever having used/experimented with cannabanoids. And, this finding tends to entirely reverse itself in the adult cohort (age 26 and above), where the representation of nonwhites noticeably exceeds that of the whites (17 percent versus 12 percent). These findings are consistent for hashish and ostensibly other cannabanoid products as well. Other findings could be highlighted by suggesting that:

- Among the younger cohorts, the use of LSD and other hallucinogens occurs more frequently among whites; a similar but weaker relationship is observable in the adult cohort.
- Cocaine use is more prevalent among blacks than whites in both the youngest and oldest cohort; curiously, the representation of white cocaine users is stronger in the 18 to 25 year cohort.
- Whites, regardless of age cohort, are more strongly represented among the users of prescription psychotropics for euphoric or other nonmedical purposes.

When the distributions of current prevalence (i.e., use in the last month) are considered a number of racial differences emerge:

- Among 12- to 17-year-olds and 18- to 25-year-olds, the representation of marijuana use is *greater* among whites than nonwhites; some 13 percent of the whites in the youngest cohort reported recent use compared to 10 percent of the nonwhite adolescents; among persons 18 to 25, some 26 percent of the whites reported recent use as opposed to 22 percent of the nonwhite group.

- Among persons 26 years old and above, the representation of current marijuana use is twice as great among nonwhites (6.2 percent) as among whites (3 percent).
- Current use of hashish is strongly associated with whites.
- Current prevalence of cocaine and heroin is strongly associated with blacks in the oldest age cohort.

The strongest racial differences emerge for the prescription psychotropic drugs which are being used nonmedically. Consider the distribution presented in table 28 among young adults aged 18 to 25:

TABLE 28.—*Racial distribution of nonmedical use of prescription psychotropic drugs, among young adults 18 to 25, in percent*

Drug	Whites	Nonwhites
Any drug	7.5	3.8
Sedatives	2.7	0.7
Tranquilizers	2.5	3.8
Stimulants	5.3	1.8

These data are clear in their suggestion that the use of these drugs is more strongly associated with the white rather than the nonwhite population cohort. In each category, excluding tranquilizers, the representation of whites far exceeds the exhibited proportion of nonwhites. This distribution replicates itself, but not as strongly, in both the adolescent and adult (aged 26 plus) cohorts.

Incidence of Drug use

While "prevalence" measures the extent of any condition existent in a population, "incidence" measures changes currently occurring in that population. In the area of drug use/abuse, one of the best measures of incidence is the proportion of new users of new "starts" occurring within a specific period. The data on current prevalence suggests that, while drug usage is certainly widespread, the dramatic increase in the level of usage occurring in the early 1970s has leveled off and, for most agents, has begun to recede. Table 29 compares 1974 and 1975 data on "new starts".

Not only do the data indicate the relative stability in the rate of increase and lifetime prevalence, but they also show that this stability extends to the demographic characteristics of users as well. In the case of marijuana (the second most commonly used drug), the sex, age, race, and geographic (metropolitan–nonmetropolitan) distribution has remained virtually unchanged between the 1974 and the 1976 study.

High School Surveys

The data reported by the Social Research Group are supported by other research. A study conducted on high school seniors by the Institute for Social Research at the University of Michigan assessed the changing levels and types of drug use by youth. These data, reflecting interviews with some 17,000 high school seniors surveyed in 125 high schools in the spring of 1976, represent a national cross section of all seniors enrolled in public and private schools in the United States (Johnston 1976).

The study concluded that for *all illicit drugs except marijuana there has been essentially no*

TABLE 29.—*New starts by drug, age and year, in percent*

Drug	1974		1975	
	12–17	18+	12–17	18+
Marijuana	9.0	2.0	8.2	2.8
Hashish	5.0	1.0	4.9	1.4
Glue, inhalants	1.9	<0.5	2.4	<0.5
LSD, hallucinogens	2.4	<0.5	1.8	<0.5
Cocaine	1.5	0.9	2.0	0.8
Heroin	<0.5	<0.5	<0.5	<0.5
Methadone	0.5	0.5	<0.5	<0.5
Other opiates	1.5	0.6	1.5	0.7
Prescription psychotropics	7.0	7.0	7.5	11.4

Source: Abelson and Fishburne 1976.

TABLE 30.—*Drug use among high school seniors in 1975 and 1976, in percent*

Drug	Lifetime use		Use within last 12 months		Use within last 30 days	
	1975	1976	1975	1976	1975	1976
Marijuana[1]	47.5	52.9	40.0	44.7	27.3	32.2
LSD	11.6	11.1	7.5	6.4	2.5	2.1
Psychedelics (other than LSD)	14.3	11.9	9.6	6.9	3.9	2.3
Cocaine	9.2	9.8	5.8	6.2	2.1	2.1
Amphetamines	22.5	22.9	16.4	16.0	8.7	8.0
Methaqualone	8.3	8.2	5.3	5.0	2.3	1.9
Barbiturates	17.1	16.7	11.0	10.0	4.9	4.1
Tranquilizers	17.2	17.3	10.8	10.8	4.3	4.3
Heroin	2.3	2.1	1.2	1.0	0.6	0.4
Narcotics (other than heroin)	9.2	9.6	5.9	6.0	2.3	2.3
Alcohol	90.5	92.2	84.9	86.6	68.3	69.2

[1] If marijuana is excluded from the analysis, lifetime prevalence decreases to 34.6 percent in 1976 and 34.5 percent in 1975—representing essentially no change.

Source: Johnston 1976.

change in usage levels over the past year; the levels observed among 1975 and 1976 high school seniors previously studied were almost identical (Johnston 1976). Distributions are indicated in table 30.

Some of these findings may be summarized as follows:

- In 1976 some 58 percent of the Nation's high school seniors had used an illicit drug during some time in their life. This is up slightly from 1975 when the lifetime statistic was 54 percent of the graduating class.
- In the 30 days previous to interview, some 35 percent of the class of 1976 had used some illicit drug.
- If marijuana is excluded, this proportion drops dramatically to only 13.6 percent of the population.
- Alcohol, not surprisingly, is still the most commonly used substance with 92 percent of the population reporting lifetime use and 69 percent reporting use within the last 30 days.
- Males tend to be more strongly represented in the population of drug users than females except in regard to amphetamine and barbiturate use, where the representation is equal between the sexes.

The national survey and high school study imply not only that use of psychoactive drugs is widespread but also that, for most drugs, and within most demographic cohorts, use has leveled out; the large increases noted in the early 1970's are no longer in effect. Only two drugs—alcohol and marijuana—have demonstrated any notable gain.

The continual rise in both the prevalence and incidence of alcohol and marijuana use deserves special recognition. It is likely that the concurrent use of alcohol and marijuana with other psychotropics is extensive in not only the population who use drugs for social/recreational/euphoric purposes, but with the larger population of psychotherapeutic drug users as well. The simultaneous and concurrent use of alcohol especially is so common that it is significantly underreported in all of the research. Consider the CODAP data: Alcohol as a secondary drug (problem) is not as extensively mentioned as its prevalence would indicate. Too, in terms of drug use during treatment, it would be much easier to "cheat" by using either alcohol and/or marijuana, since the standard urine surveillance tests administered by treatment programs would not detect them.

These observations are offered to sensitize the reader to the extent of polydrug use. Other research has defined the nature and extent of this use; in a landmark study of drug use by young men, the question of multiple drug use in the population was considered (O'Donnell et al. 1976). Consider table 31.

Note that the use of *any* substance is positively associated with the use of other substances; if an answer of "yes" occurs in any drug column, it increases the probability of a positive response in other drug categories as well.

The combination of the two legal substances of alcohol and tobacco is unquestionably the most prevalent one in our society. More significant for the purposes of this report is the concurrent use of alcohol by those who use other drugs. These data clearly imply that regular users of psychotropics are also regular drinkers; concurrent alcohol use, then, *cannot* be overlooked in the examination of any drug pattern.

Active User Research

The implications of the O'Donnell study are strengthened by another set of studies which examined active drug users in 12 cities and locales. The data were collected by scientists working with the Resource Planning Corporation of Washington, D.C. and have recently been reported in the Report of the Acute Drug Reactions Project (Inciardi et al. 1976). Fifty-three percent of the interviews were collected in 1973, 34 percent during 1974, and 13 percent during 1976. Study methodologies were designed to elicit data from persons who would typically be invisible to a standard household survey: transients, "street people," etc. The method employed a sociometrically oriented approach in which various subcultural social networks would be identified, and then the individual members of this network would be located and interviewed. While this method does include as many "representative" individuals as possible in the study group, it does not have the rigorous sampling design apparent in even a modest survey. Because the method focused solely on active users, it eliminated either former users or those who were, in one way or another, largely peripheral to the drug subculture existent in that locale.

The series of studies ultimately contacted some 2,288 respondents. This survey population could be characterized by suggesting that it was primarily (68 percent) white (versus 24 percent black, 4 percent Hispanic, and 3 percent Native American); the median age was 22; and almost two-thirds (64 percent) male.

Drug Onset

Drug onset data were available for 1,343 respondents. For more than half of these (57 percent), alcohol specifically reported as "alcohol to excess" was recalled as their first drug of abuse. An additional quarter (27 percent) report that marijuana was their first drug; only 5 percent report an opiate—specifically heroin—as their first drug. The median age of first drug use was 15 years; almost one-fourth report initiating some form of drug use at the age of 12 or under. Not surprisingly, the readily available legal but abusable substances—such as alcohol, solvents, and inhalants—were the chemicals that were used at the youngest age.

When current drug use is considered, the following distribution, based on Inciardi's (1976) active user studies by drug of choice, emerges:

	Percent
Marijuana	46.4
Heroin	18.0
Cocaine	8.4
Alcohol	7.0
Hallucinogens	5.1
Stimulants	1.0
Other sedatives	
Methadone	
Other narcotics	
Solvents/inhalants	10.9
Tranquilizers	
Analgesics	
Other	

Multiple drug use was typical of this population. Each respondent indicated the regular use of at

TABLE 31.—*Percent of users and nonusers of each drug who have used other drugs*[1]

	Tobacco		Alcohol		Marijuana		Psychedelics		Stimulants		Sedatives		Heroin		Opiates		Cocaine	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Drug	*n* 2,211	299	2,434	76	1,382	1,128	550	1,960	581	1,929	409	2,101	148	2,362	493	2,017	352	2,158
Tobacco			90	41	94	81	95	86	96	86	95	87	99	87	96	86	96	87
Alcohol	99	85			100	94	100	96	100	96	100	96	100	97	100	96	100	96
Marijuana	59	27	57	4			100	43	97	42	97	47	99	52	91	46	100	48
Psychedelics	24	9	23	0	40	([2])			71	7	80	11	92	18	72	10	89	11
Stimulants	25	7	24	0	41	1	75	9			82	12	86	19	71	21	86	13
Sedatives	18	6	17	1	29	1	60	4	58	4			80	12	60	6	72	7
Heroin	7	([2])	6	0	11	([2])	25	1	22	1	29	1			27	1	38	1
Opiates	21	7	20	0	33	4	65	7	60	7	73	9	91	15			79	10
Cocaine	15	5	14	0	25	([2])	57	2	52	3	62	5	90	9	56	4		

[1] For stimulants, sedatives, and opiates, quasimedical use was defined as no use.

[2] Less than ½ of 1 percent.

Source: O'Donnell 1976.

least three different substances. Furthermore, some 45 percent of the respondents admitted to the regular use of two or more of these substances in combination with one another.

For the most part, these data on incidence and prevalence—collected through a large number of wholly unrelated studies—tend to support each other. The drugs most commonly used are alcohol and marijuana; multiple use tends to be a modal pattern; and the use of drugs tends to relate strongly to availability. The relative ease with which a substance can be obtained seems to figure prominently into whether it is likely to be used/abused by youngsters. The use of solvents, inhalants and alcohol by persons in the youngest cohorts to the exclusion of other substances therefore does not imply a preference but rather reflects the relative unavailability of other drugs to children.

SUMMARY AND CONCLUSIONS

In the parable introduced by this discussion, the individual blind men had no sense of what was confronting them. As observers, however, we have the advantage of knowing that the phenomenon we are trying to describe involves a substantial proportion of our population and that it appears somewhat differently among various sociologic and/or demographic groups.

Like the blind men described in the parable, the various studies that were presented in this report are entities unto themselves. Because the methodological perspective of each varies considerably, comparisons are of little use. Instead, we are forced to recognize that the state of the art will only allow for partial descriptions.

Given these limitations, a number of useful interpolations can still be made.

Drug Surveys

A number of surveys have concurred in the observation that the use of illicit psychoactive drugs, with the exception of marijuana, has largely been contained, and the meteoric use in drug abuse occurring in the early part of the decade has come to an end. These surveys are clear in their suggestion that alcohol, marijuana, and legally manufactured drugs are the most commonly used substances.

Young adults—roughly between the ages of 18 and 26—are the ones most likely to be the consumers of any of these psychoactive drugs in a nonmedical context. The data are similar for alcohol users, although drinkers tend to be slightly older.

If we are to consider the use of nonmedical substances to deal with or cope with stress, some data suggest that alcohol is frequently resorted to. Women are overrepresented among users on antianxiety medicines; women are also more likely to be consumers of medical services, typically consulting physicians more frequently than men.

Men, however, are more likely to drink *and* are more likely to be heavy drinkers as well. It is not entirely unreasonable to assume, therefore, that both sexes are coping chemically with their stresses and anxieties.

A similar hypothesis has been advanced to explain differentials between other groups. Those having access to medical care will deal with stress through the use of prescription medications. Those who do not have such access will either use alcohol or nonprescription medications.

Intervention Data

The data coming from institutional sources—drug treatment programs, hospitals, crisis centers, etc.—also demonstrate a measure of consistency. Major drug problem patterns appear to be solidifying, and similar population representations and distributions are occurring.

The overwhelming proportion of drug overdoses and acute reactions involve a legally manufactured and distributed drug. It is likely that as long as diazepam retains it popularity, it will be the single drug most often mentioned in a medical emergency involving a drug.

Moreover, it is likely that alcohol will continue to be used simultaneously with other psychoactive drugs. As such, we can continue to expect that alcohol-related drug overdoses incidents will persist.

Treatment data similarly show a significant amount of consistency. The representation of persons presenting with a primary heroin problem has remained constant over a 4-year period of time. It is likely, however, that other depressant drugs, including alcohol, will be responsible for motivating a larger number of people to enter treatment in the future.

The study of the incidence and prevalence of drug use/abuse tests the very nature of our epidemiologic tools. We need ways of integrating the incredibly rich sources of data that we currently have available. Until this integration occurs, our efforts will resemble those of the individual describing only a small part of an enormous phenomenon.

REFERENCES

Abelson, H. I., and Fishburne, P. M. *Nonmedical Use of Psychoactive Substances.* Part 1: *Main Findings.* Princeton, N. J.: Response Analysis Corporation, 1976.

Blackwell, B. "Medical, Social and Ethical Issues in Minor Tranquilizer Use." Paper presented at World Congress in Mental Health. Vancouver, B. C.: the Congress, 1977.

Cahalan, D.; Cisin, I. H.; and Crossley, H. M. *American Drinking Practices.* New Brunswick, N. J.: Rutgers Center of Alcohol Studies, 1964.

Carter, J. "The Problem of Drug Abuse in America." *Congressional Record,* ed. Eugene Patterson, Aug. 2, 1977 (S13293), PM103.

Chambers, C. D.; Inciardi, J. A.; and Siegal, H. A. *Chemical Coping.* New York: Spectrum Publications, 1975.

Cisin, I. General populations. (Nationwide and State.) In: *The Epidemiology of Drug Abuse: Current Issues.* NIDA Research Monograph 10. Rockville, Md.: the Institute, 1977.

DuPont, R. L. Poly-drug abuse and the maturing national drug abuse data base. *Annals of the New York Academy of Science,* Vol. 281, Dec. 1976.

Elinson, J. Status of operational definitions. In: *The Epidemiology of Drug Abuse: Current Issues.* NIDA Research Monograph 10, National Institute on Drug Abuse. Washington, D. C.: Supt. of Docs., U. S. Govt. Print. Off., 1977.

Gould, L. G., and Thompson, W. D. "Critique of: Leon Gibson Hunt's Prevalence of Active Heroin Use in the United States." ed. by Joan Dunne Rittenhouse. Stanford Research Institute, Rockville, Md., National Institute on Drug Abuse, 1976.

Hunt, L. G. Prevalence of active heroin use in the United States. In: *The Epidemiology of Heroin and Other Narcotics.* NIDA Research Monograph 16, National Institute on Drug Abuse. Washington, D. C.: Supt. of Docs., U. S. Govt. Print. Off., 1976.

Inciardi, J.; McBride, D. C.; Pottieger, A. E.; Russe, B. R.; and Siegal, H. A., et al. *Acute Drug Reactions in a Hospital Emergency Room.* NIDA Special Services Research Monograph. National Institute on Drug Abuse. Washington, D.C.: Supt. of Docs., U. S. Govt. Print. Off., 1978.

Inciardi, J.; McBride, D. C.; Russe, B. R.; Wells, K. S., et al. The Acute Drug Reactions Project. Unpublished report. DHEW Grant H81DA0880, 1976.

Johnston, L. *Monitoring the Future: A Continuing Study of the Life Styles and Values of Youth.* Ann Arbor, Mich.: Institute for Social Research, 1976.

National Commission on Marijuana and Drug Abuse. *Marijuana: A Signal of Misunderstanding. The Technical Papers of the First Report of the Commission.* Vols. I and II. Washington, D. C.: Superintendent of Documents, U. S. Government Printing Office, 1972.

______. *Drug Use in America: Problem in Perspective. Second Report of the Commission.* Washington, D. C.: Superintendent of Documents, U. S. Government Printing Office, 1973.

National Institute on Drug Abuse. *Supplemental Report April 1973-September 1974. Methodology, Client Characteristics, Drug Abuse Pattern, Drug Type and Drug Abuse and Glossary.* Series 1, Supplement 1. Rockville, Md.: the Institute, 1974.

National Institute on Drug Abuse. *Annual Summary Report 1975. Data from the Client Oriented Acquisition Process (CODAP).* Statistical Series E, No. 1. Rockville, Md.: the Institute, 1975a.

National Institute on Drug Abuse. *DAWN III.* Rockville, Md.: the Institute, 1975b.

National Institute on Drug Abuse. *Annual Summary Report 1976. Data from the Client Oriented Data Acquisition Process (CODAP).* Statistical Series E, No. 4. Rockville, Md.: the Institute, 1976.

National Institute on Drug Abuse. *National Drug/Alcohol Collaborative Project: Issues in Multiple Substance Abuse,* Gardner, S. E., ed. DHEW Pub. No. (ADM)80-957. Washington, D. C.: Supt. of Docs., U. S. Govt. Print. Off., 1980.

O'Donnell, J. A.; Voss, H. L.; Clayton, R. R.; Slatin, G. T.; and Room, G. W. *Young Men and Drugs.* NIDA Research Monograph 5, National Institute on Drug Abuse. Washington, D. C.: Supt. of Docs., U. S. Govt. Print. Off., 1976.

Parry, H. National patterns of psychotherapeutic drug use. *Archives of General Psychiatry,* Vol. 28, June 1973.

Robins, L. Target populations. In: *The Epidemiology of Drug Abuse: Current Issues.* NIDA Research Monograph 10. National Institute on Drug Abuse. Washington, D. C.: Supt. of Docs., U. S. Govt. Print. Off., 1976.

Sample, C. J. Concept of poly-drug use. In: *Epidemiology of Drug Abuse: Current Issues.* NIDA Research Monograph 10. National Institute on Drug Abuse. Washington, D. C.: Supt. of Docs., U.S. Govt. Print. Off., 1977a.

Sample, C. J. CODAP. In: *The Epidemiology of Drug Abuse: Current Issues.* NIDA Research Monograph 10. National Institute on Drug Abuse. Washington, D. C.: Supt. of Docs., U. S. Govt. Print. Off., 1977b.

U. S. Department of Health, Education, and Welfare. *Alcohol and Health—New Knowledge.* Rockville, Md.: Alcohol, Drug Abuse, and Mental Health Administration, 1974.

BLANK PAGE

Chapter 3
Methadone Maintenance and Alcohol Use

Barry Stimmel, M.D.
Mount Sinai School of Medicine of the City University of New York

DEFINING THE PROBLEM

Alcoholism has come to be recognized as the country's No. 1 public health problem. An estimated 4 percent of the U.S. public consumes excessive quantities of alcohol, and alcoholism has been noted in 10 million Americans. Figures pertaining to narcotic dependency, while far less impressive, are nonetheless revealing. Approximately 170,000 people are in treatment for opiate addiction; another 300,000 to 500,000 are not in treatment, and the majority of these have never received such services (Nightingale 1977). Other estimates of prevalence of dependency on narcotics range from 626,000 to 724,900 (DEA 1974). While these figures are only estimates, data obtained from treatment program admissions and hepatitis case reports give conclusive support to the dependency trend: Between 1967 and 1974, heroin use as represented by these sources increased by a factor of more than 10.

Since persons who consume either alcohol or heroin in considerable quantities might be expected to have a tendency to use other mood-altering drugs, it should not be surprising that a considerable crossover may occur between use of these agents. Unfortunately, a persistent misconception has existed concerning the absence of alcoholism in heroin addicts. This belief is related to the past difficulty in gathering data appropriate to alcohol consumption in this population. The experience of methadone maintenance programs has brought to attention the extent of alcohol consumption by clients; however, this association has sometimes been interpreted to indicate that methadone ingestion per se may lead to alcoholism. Part of this belief is based on the adage—unchallenged until recently—that a heroin addict has no need for alcohol.

Over the past several years increasing attention has been focused on the prevalence of alcoholism in narcotic-dependent persons. The surveys to be discussed in this chapter can be grouped into four major categories:

1. Demographic surveys of incidence and prevalence of multiple substance use in drug-abusing populations;
2. Surveys of alcoholism or multiple substance use in persons in methadone maintenance programs;
3. Estimates of alcoholism based on the presence of medical complications in drug addicts specifically related to excessive alcohol consumption; and
4. Estimates of alcoholism based on toxicologic and pathologic findings obtained through postmortem examinations of narcotic addicts.

Unfortunately, epidemiologic studies not infrequently present markedly different findings with respect to incidence and prevalence of drug use, type of drug used, and degree of use. There are many reasons for these discordant results. Intake of data will fluctuate within an individual study. Further, results based on aggregate data incorporate diverse intake sources, with the quality of each varying greatly. For example, at times information may be recorded retrospectively—on the basis of a chart review—rather than firsthand. Definitions of use (such as regular, excessive, occasional, etc.) will also vary with each study. Study populations may contain an inherent bias by being composed of a particular subject type. Finally, comparative data among nonheroin addicts who are demographically similar to the target population are almost never presented. These problems, as discussed below, may seriously impair conclusions concerning increased prevalence of alcohol use among narcotic-dependent persons.

Data from Multiple Centers

Epidemiologic studies of alcohol and polydrug use in heroin addicts in treatment can be divided into two main groups: those utilizing aggregate data from multiple centers (e.g., Drug Abuse Warning Network, National Drug Abuse Treatment Utilization System [NDATUS]) and studies relating to specific population groups within a particular drug treatment facility. One of the largest comprehensive studies of the former type is the National Drug/Alcohol Collaborative Project (National Institute on Drug Abuse 1980). The NDACP sample contains intake data on 1,544 individual subjects enrolled in 10 facilities located throughout the country; it consists of sequential and concurrent information on 17 substance categories, including alcohol, heroin, amphetamines, barbiturates, coffee, tea, and tobacco.

The consumption of alcohol and opiates by patients in the NDACP study is illustrated in table 1. The drug most frequently consumed among this population was alcohol; drinking was reported by 98 percent of the study population. Narcotic (heroin) use was noted in 41 percent, illicit methadone in 18 percent, and other narcotic agents in 48 percent of the population. Not unexpectedly, alcohol was also the substance consumed at the youngest mean age, i.e., 13.8 years. The mean age for first use of heroin was 19 years, with the use of other opiates beginning at a mean age of 20.5 years; the intake of illicit methadone began considerably later (24.2 years). Regular use was defined as the consuming of a drug nearly every day for at least a month. Of those persons ever consuming alcohol or narcotics, the greatest number to become regular users of either substance was found in the heroin category (71 percent), followed by alcohol (61 percent). Of the regular users of heroin, 64 percent drank on a regular basis; regular users of other opiates and illegal methadone also had high consumption levels (65 and 77 percent, respectively). Similar figures were found for those who ever (rather than regularly) used the same drugs (ranging from 62 to 67 percent). A lesser number of other opiate users (28 percent) and illicit methadone users (27 percent) become regular users. The mean age at which regular drug use first began was approximately one year after mean age of first use in each of the categories, with the exception of initiation of regular alcohol use which began approximately 7 years after first use.

The prevalence of the use of drugs for enhancement purposes is illustrated in table 2. Those persons dependent on heroin or other opiates were much more likely than the regular users of alcohol to use booster drugs (70.8 and 71.4 percent versus 53.6 percent); users of illegal methadone, as might be expected, were even more inclined (73.1 percent). Regular alcohol users, on the other hand, were more likely (30.6 percent) to smoke marijuana for enhancement than the drug users (11.9 to 22.8 percent). Almost 24 percent of the heroin users preferred cocaine to any other enhancer.

TABLE 1.—*Type of drug consumed and age of first exposure and regular use (NDACP study, final report)*[1]

Drug Use	Alcohol consumers		Heroin addicts		Other opiate users		Illicit methadone users	
	n	Percent	*n*	Percent	*n*	Percent	*n*	Percent
Number	1514	98[2]	634	41[2]	733	48[2]	271	18[2]
Age first use (years)	13.8		19		20.6		24.2	
Regular users	925	61[3]	451	71[3]	197	28[3]	69	27[3]
Age first regular use (years)	21.5		20.5		22.1		N.A.	

[1] Categories of drug use are not mutually exclusive.

[2] Percent refers to percent of total study population, *n* = 1544.

[3] Percent refers to percent of total consumers becoming regular users.

N.A. = Not available.

TABLE 2.—*Percent of regular users of opiates or alcohol who used other drugs for enhancement purposes*[1]

Booster	Regular drug			
	Alcohol	Heroin	Other opiates	Illegal methadone
Any drug	53.6	70.8	66	72.1
Alcohol		18.8	24.0	21.6
Heroin	8.5		14.3	26.1
Other opiates	2.0	6.3		3.7
Illegal methadone	1.2	3.1	1.0	
Amphetamines	12.5	10.3	8.7	3.0
Barbiturates	10.6	8.9	12.2	8.2
Marijuana	30.6	22.8	17.3	11.9
Cocaine	3.5	23.9	2.6	7.5

[1] Percentages do not sum to 100 because response items are not mutually exclusive.
Source: NDACP Final Report, 1977 (National Institute on Drug Abuse, 1980).

Significant comparisons can be made with data shown in table 3 (which measured substitution for *any* purpose). Here only 17.5 percent of regular alcohol users smoked marijuana as a substitute for the substance of choice, and only 3 to 8.8 percent of the drug users did so. Similarly, the popularity of cocaine with heroin users had slipped to 2.9 percent—indicating that, in this sample, certain substances are clearly selected in relation to their potential use with other agents. It might therefore be hypothesized that the enhancement value of a substance may be more significant to multiple drug use than availability alone.

CODAP, established by the National Institute on Drug Abuse, contains admission and discharge data on all clients treated by federally funded drug abuse programs. Although CODAP is designed primarily to report admissions of heroin addicts and may therefore underestimate prevalence of coexisting alcohol and narcotic use within that treatment population, approximately 18 percent of the 55,120 clients listed in the April-June 1976 quarterly report did indicate some kind of alcohol problem. Of the 34,135 patients in this report with a primary heroin problem, only 3.3 percent listed alcohol as a secondary drug of abuse, with 72 percent of heroin addicts reporting dependency on only heroin without any other substance abuse problem (National Institute on Drug Abuse 1976). Thus, the NDACP and CODAP samples present somewhat conflicting findings regarding alcohol use by primary heroin (3.3 percent in CODAP and 16 percent in NDACP).

The difficulty with the acceptance of CODAP findings relates to questions that may be raised concerning the validity of this large trend data base. As previously indicated, the quality of data gathering in the system may vary greatly with the individual intake worker as well as the specific project site. In addition, undue reliance should not be placed on alcohol data obtained on the basis of self-reporting by persons awaiting treatment for heroin addiction. It is therefore possible that the concomitant use of alcohol and heroin is greatly underestimated.

TABLE 3.—*Percent of regular users who substituted another drug for opiates or alcohol*[1]

Booster	Regular drug			
	Alcohol ($n = 925$)	Heroin ($n = 449$)	Other opiates ($n = 193$)	Illegal methadone ($n = 133$)
Any drug	33.4	58.1	48.0	69.9
Alcohol		12.7	9.3	9.0
Heroin	4.3		17.6	52.6
Other opiates	1.7	17.6		9.8
Illegal methadone	0.2	12.0	2.6	
Amphetamines	2.8	4.9	0.5	0
Barbiturates	6.1	10.0	8.3	2.3
Marijuana	17.5	5.1	8.8	3.0
Cocaine	1.0	2.9	1.0	2.3

[1] Percentages do not sum to 100 because response items are not mutually exclusive.
Source: NDACP Final Report, 1977 (National Institute on Drug Abuse, 1980).

Small-Scale Data From Single Centers

Studies dealing with well-defined population groups, although somewhat smaller in sample size, have particular value due to the greater uniformity of data gathering. In this regard, the medium-sized study by Barr et al. (1976) is of interest. In a group of 864 heroin addicts—274 of whom entered the Eagleville Hospital and Rehabilitation Center (EHRC), a drug-free residential therapeutic community, and 590 a methadone maintenance program—50 percent of the total sample were found to consume a considerable amount of alcohol, and 25 percent had a history of problem drinking. Of the problem drinkers, the clinical picture with respect to toxicity of alcohol and effects of drinking was identical to that seen in a comparable group of alcoholics not addicted to heroin. Of the doubly addicted subjects, approximately 60 percent were considered alcoholics at the time they entered treatment for narcotic addiction.

Brown et al. (1973), in a study of 140 narcotic addicts, found that use of alcohol prior to the use of heroin significantly exceeded alcohol use by a nonaddict control group, both in frequency and quantity. Although the percentage of heroin addicts drinking during their period of addiction decreased from preaddiction levels, 54 percent of men and 50 percent of women still consumed considerable quantities of alcohol during the period of heroin addiction.

Perkins and Bloch (1970), in a retrospective survey of 521 patients admitted to a methadone maintenance program, found an extensive history of substance abuse, with 47 percent of patients (245) using one to four drugs in addition to heroin. Sixty percent of this population (313) consumed alcohol; however, an alcohol "problem" was noted in only 10 percent. In a study of 183 male drug addicts, Rosen et al. (1975) found that the most common substance used legally by 89 percent was alcohol, with 21 percent consuming considerable quantities of alcohol concurrent with their heroin abuse. Drinking among these persons was so impressive that the authors concluded that, if intervention had occurred at an earlier age, the diagnosis for about half of the patients would have been alcoholism or alcohol abuse rather than heroin dependency. Concurrent use of alcohol and heroin use has also been noted by other investigators. The importance of careful questioning concerning alcohol has been emphasized by Stimmel et al. (1972) in a survey of several hundred patients entering methadone therapy. Eighty-five percent of all persons closely questioned prior to initiation of therapy gave a history of considerable, though not necessarily excessive, alcohol consumption. Almost all of these persons had denied current alcohol use when the intake worker asked on a routine admission questionnaire if they drank.

Epidemiological data therefore suggest that with heroin addicts, alcohol is the drug first and most frequently abused before initiating heroin use or becoming addicted. In addition, a high frequency of excessive use of alcohol is common in the life histories of chronic heroin addicts (Brown et al. 1973; Jackson and Richman 1973; Kolb 1962; O'Donnell 1969; Rosen et al. 1975). Further, clinicians find that when heroin or other opiates are not available, alcohol is the most frequent drug sought after by addicts as a substitute agent to relieve symptoms of anxiety or discomfort.

Cross Utilization in Animal-Human Correlates

The cross utilization of alcohol and narcotics may not merely represent the tendency of a drug-dependent person to abuse several drugs. Experimentally, increasing evidence has been presented to suggest a relationship between alcohol and opiate dependency. Strains of rats bred to ingest large quantities of morphine have been found to drink more alcohol than control animals (Nichols and Hsiao 1967). In rats bred to consume large amounts of alcohol, morphine has been shown to have a suppressive effect (Blum et al. 1976). In animals undergoing alcohol withdrawal, the acute administration of morphine results in a suppression of the alcohol-induced convulsions. The morphine's suppressive effect lasts longer than its analgesic effect, suggesting that its action in combination with alcohol diverges from the usual depressant effect of morphine and is due to a specific interaction between the two drugs. Clinically, these interactions may explain the concurrent use of alcohol and narcotics in heroin dependency.

Medical Evidence of Dysfunction Among Drinking Narcotic Addicts

Medical studies have also indicated an impressive prevalence of alcoholic dysfunction in heroin addicts. Maddux and Elliott (1975), in a study of 212 former heroin users maintained on methadone, noted hepatomegaly (liver disorder) in 34 percent of the problem drinkers as compared to 16 percent of nondrinking subjects. In a survey of heroin users with persistent chemical indicators of hepatitis associated antigen and antibody, hepatic biopsy revealed alcoholic injury in 10 of 12 specimens (Stimmel et al. 1972).

In post-mortem studies of heroin users, Baden (1970, 1972) noted that a significant incidence of liver disease occurred mainly in those persons with a history of alcoholism. Similar findings were also observed by Force and Miller (1974) who reviewed the prevalence of liver disease in persons dying of acute fatal narcotism. The incidence of chronic liver disease in blood alcohol positive cases was approximately twice that seen in blood alcohol negative cases. Cherubin et al., in a review of epidemiology of death in narcotic addicts, found the presence of appreciable quantities of alcohol in the tissues of greater than 50 percent of the deceased addicts studied (1972). A recent study of risk factors associated with mortality in heroin users found heavy alcoholism to be the only factor significantly differentiating 200 deceased heroin users from a control group (Baden 1972). Garriott and Sturner (1973), in a study of 22 heroin addict fatalities, found 73 percent of cases to have the presence of alcohol or other drugs on toxicologic examination.

Alcohol/Drug Dysfunction in Animal-Human Correlates

Experimental evidence with laboratory animals also addresses increased toxicity with combined administration of narcotics and alcohol. Rats treated with high doses of morphine or methadone have a markedly prolonged retention of alcohol in the blood stream (Ho et al. 1977). Morphine administration markedly increases mortality in mice pretreated with alcohol (Venho et al. 1955). Similarly, the depressant effects of alcohol are markedly potentiated by morphine (Eerola et al. 1955; Ho et al. 1977). These findings may be relevant to the association of narcotics and alcohol on post-mortem examinations.

Alcoholism in Patients on Methadone Maintenance

Considering the tendency of heroin addicts to use and misuse alcohol, it is not surprising that the expansion of methadone maintenance—a treatment modality which requires close observation of patients—has resulted in recognition of alcoholism as a serious problem. Bihari, in examining maintained addicts, cites alcohol as the major drug of abuse, with approximately 40 percent of patients admitted to methadone programs consuming excessive amounts of alcohol and 5 percent estimated to be severe alcoholics (Bihari 1974).

The prevalence of alcohol abuse in methadone maintenance programs is difficult to determine. Reports of prevalence have ranged from 12 percent to 40 percent, with some investigators citing an alcohol abuse increase of as much as 100 percent following the initiation of methadone therapy (Bloom and Butcher 1970; Johnston and Williams 1970; Liebson et al. 1973; Maddux and Elliott 1975; Schut et al. 1973). In a 10-year followup of alcohol abuse among more than 15,000 persons on New York City methadone programs, problem drinking was reported in only 10 percent to 20 percent of the client cohorts. Further, the percentage of patients with drinking problems increased with time in treatment, with an average of 13 percent exhibiting problems after 4 years of therapy as compared to 11 percent after 2 years (Gearing 1970). Kreek (1973) reported that, of 129 patients maintained on methadone for 3 years or longer, 25 percent were drinking the equivalent of four or more ounces of whiskey per day. Other investigators have found alcohol use in methadone maintained patients to increase from 34 percent of the sample before admission to 74 percent after more than 8 months of methadone therapy (Simpson 1973).

Regardless of the varying prevalence figures of alcoholism in persons on methadone maintenance, there is no question that the phenomenon interferes considerably with the rehabilitative process, and may be responsible for termination of methadone therapy. Gearing (1970), in a review of 405 persons discharged from methadone maintenance, found that 28 percent of the women and 18 percent of the men had been discharged primarily for alcohol abuse. Similarly, Chambers et al. (1973) reported 11 percent of 138 terminated patients were discharged for alcoholism. Comparing 48 persons discharged from methadone maintenance with an active treatment population of 436 patients, Perkins and Bloch (1970) found alcoholism to be present in 29 percent of the former but only 6 percent of the latter.

Alcoholism Trends in Nonaddicted Populations

Although the figures dealing with the prevalence of alcoholism in patients on methadone maintenance appear to be impressive, they neither indicate nor suggest a causal relationship between methadone maintenance and alcoholism. Before reaching the conclusion that methadone produces alcoholism (Baden 1970; Bloom and Butcher 1970; Liebson et al. 1973), it is necessary to remember that such a statement can be considered valid only after comparison with matched heroin addicts and/or matched nonaddicted populations. Almost no evidence, however, has been published concerning the presence of alcoholism in heroin addicts enrolled in drug-free treatment modalities.[1] Relatively little evidence has accumulated also concerning the consumption of alcohol among populations of a socioeconomic stratum comparable to that of heroin-dependent persons. The following studies, which use a variety of methodologies to address the problem, have all been recent.

Preble and Miller (1977), in a survey of polydrug use among methadone patients residing in a specific community, stated that alcohol use among other members of the community was so common that this substance was not considered in the survey unless consumed in combination with other drugs. Alcohol consumption as a population norm was also explored by Brunswick, who reviewed health and social behavior in 752 inner-city adolescents 12–17 years of age, the majority of whom were black (Brunswick 1977). Drinking was found to be significantly related to use of other drugs only in the younger teens. By 16–17 years of age, no more drug users were drinking than other young people that age. Although the sample size was relatively small and the age of the subjects much younger than the age of persons on methadone maintenance, the findings do suggest that alcohol use is common among inner-city residents regardless of coexisting use of other mood-altering substances.

More intensive studies have reached similar conclusions on the acceptability of alcohol use. Knupfer (1967), in a survey of problem drinking among Bay Area nonaddicted males obtained through a review of records, subject interviews, and interviews of family members, noted that 20 percent of all persons gave evidence of problem drinking. Robins and Guze (1970) performed a comprehensive study involving 240 men from an inner-city area which did not have a history of narcotic abuse. The subjects were chosen before any drug or alcohol problem occurred on the basis of elementary school records. A 25-year followup was performed; 95 percent of all subjects were located and interviewed. In two instances where deaths had occurred, relatives were contacted. Half the sample (48 percent), who were in their early thirties, presented evidence of social and medical problems associated with alcohol. Nine percent had already experienced hospitalization for problems due to alcohol abuse, 6 percent had experienced job problems resulting from drinking, and 3 percent had been told by a doctor that their livers had been damaged by excessive drinking.

In a study of 233 male felons discharged from a State penitentiary, Robins and Guze (1970) found 176 persons who were available to be interviewed. Alcoholism was present in 27 percent of the blacks and 47 percent of the whites. Among inner city residents, the rate of alcoholism was even higher.

These findings emphasize the prevalence of alcoholism in certain high-risk areas and suggest that the alcoholism rates in patients enrolled in methadone programs is no greater than and may even be less than that seen among similar socioeconomic populations of nonaddicts. Given this finding, it would appear that alcoholism does not develop as a result of methadone maintenance, but rather represents the inability of methadone maintenance per se to treat or control this existing problem. It should also be noted here that any discussion of causality should in no way detract from the importance of alcoholism as a major risk factor in morbidity and mortality in methadone maintained patients.

Effects of Alcoholism in Methadone Programs

Medical

The medical consequences for persons on methadone maintenance who begin to consume excessive quantities of alcohol are considerable. Treatment experience indicates that the majority of heroin addicts at one time or another have had either a clinical or nonclinical episode of viral hepatitis. Laboratory tests indicative of hepatic dysfunction in these populations indicate a high degree of abnormalities, ranging from 50 to 75 percent. When alcohol consumption is superimposed on preexisting hepatic disease, a rapid progression to fatty liver and cirrhosis may occur. Kreek (1973) noted that hepatic function tests initially normal on admission became abnormal in approximately 25 percent of patients enrolled in methadone maintenance. In almost all of these cases excessive alcoholism was detected. Hepatic coma, cirrhosis, and esophageal dysfunction with bleeding are but a few of the more serious complications associated with chronic alcohol consumption in persons on methadone maintenance. Mortality in persons enrolled in methadone may also be related to excessive alcohol consumption. In a study of 40 deaths in persons on a methadone program, alcoholism was present in 24 (60 percent) of instances, being directly responsible for 88 percent of all medical deaths and 25 percent of all deaths due to violence.[2] Scott et al. (1973), in a study of mortality in persons maintained on methadone, found that the majority of deaths occurred in alcoholics. Roizin (1969), reviewing methadone maintenance mortality rates, noted a tenfold increase in mortality when a secondary addiction to alcohol was present. These findings confirm the mortality studies of Baden (1970, 1972) who found excessive alcoholism to be the only factor differentiating deaths in heroin users from a control group.

---

[1] H. L. Barr and A. Cohen of Eagleville examine this issue in "The Problem Drinking Drug Addict."—ED.

Psychological

The appearance of alcoholism in methadone maintained persons not only results in severe medical complications, but in addition markedly interferes with the rehabilitative process; not infrequently, it is responsible for premature administrative detoxification or discharge from the program. By exerting an inhibiting effect on cortical centers, alcohol effects the appearance of aggressive behavior with frequent acting out. Patients so intoxicated cannot conform to or tolerate clinic rules, and constantly create disturbances. Unfortunately, when sober, the patient usually has little or no memory of events occurring during drinking and therefore is unable to learn from the experience. Denial of a drinking problem, common to nonnarcotic addicted alcoholics, is also prevalent among persons on methadone maintenance. The combined use of alcohol and methadone, especially with ingestion of the former shortly before or after a methadone dose, results in the synergistic action of both agents, with a greater potential for oversedation and obtundation.

Staff in most clinics, unless properly trained, react to the alcoholic methadone patient in an adverse manner. Rehabilitation may stop, in part due to the difficulty in working with one who is inebriated. However, the frustration in seeing a patient develop another dependency as equally damaging as heroin also takes its toll. Recurrent hospitalizations for gastrointestinal bleeding and liver disease are not infrequent. Further, it is difficult—if not impossible—to refer alcoholic drug clients for treatment, since most alcohol abstinence programs will not accept methadone maintained patients. The frustration and anger of clinic personnel may be transmitted to the patient who in turn, unable to handle the rejection, increases his/her acting out. The end result of such developments is often an administrative discharge or detoxification.

Detoxification for Alcohol/Drug Patients

Withdrawal from narcotics does not necessarily eliminate alcoholism. O'Donnell (1969), in an 11-year followup of 266 former heroin addicts, found 30 percent of this time span was spent in alcohol or barbiturate addiction. At the conclusion of the study, 30 percent of subjects with a predrug history of alcoholism were alcoholic, while only 7 percent were addicted to narcotics. Vaillant (1966), in a 3- to 12-year followup study of 30 former heroin addicts who remained abstinent from narcotics, found 14 (47 percent) had used alcohol during the abstinent period, with 10 (33 percent) using this agent for prolonged periods.

It is therefore not surprising that detoxification from methadone may result in an impressive increase in alcohol consumption, especially if rehabilitation has not progressed to a sufficient degree.[3] Schut et al. (1973) have noted the most numerous incidents of excessive drinking to occur in patients when they were beginning to withdraw from methadone. Once detoxification from methadone has occurred, alcoholism appears to be the single most important problem in preventing the individual from functioning as a productive member of society. Mezritz et al. (1976) found that one factor correlating with the degree of rehabilitation after detoxification from methadone was the amount of alcohol consumed during treatment or subsequent to discharge. Similarly, Jackson and Richman (1973), in a followup study of more than 300 patients who had left or were discharged from methadone therapy, found that, although abstinence from narcotics was common, alcoholism was prominent; more than 75 percent of all subjects consumed excessive quantities of liquor.

Summary

The exact prevalence of alcoholism in patients on methadone maintenance has not been clearly defined. Current studies do, however, suggest that such prevalence is probably no greater than that seen among heroin addicts or nonaddicted individuals from comparable socioeconomic strata. The hypothesis that excessive alcohol consumption in methadone patients does not exceed that of other populations in no way diminishes either the magnitude or seriousness of this problem. There is little doubt, for example, that alcoholism exposes the individual to several risks when methadone maintenance is the therapeutic modality. Concomitant excessive alcohol use slows the rehabilitative process, is associated with severe medical effects which may contribute to the patient's demise, and, finally, will often result in premature administrative detoxification from methadone maintenance. For these reasons it becomes extremely important to (a) identify methadone patients who are potentially at risk to consume excessive quantities of alcohol; and (b) develop therapeutic modalities specifically designed to deal with alcoholism in the methadone maintained patient.

---

[2] B. Concool, H. Smith, and B. Stimmel 1977: unpublished data.

[3] H. Joseph 1977: personal communication.

RECOGNIZING THE PROBLEM: DIAGNOSIS

When one considers the changes occurring in a heroin addict entering methadone maintenance therapy, it is not surprising that alcoholism and polydrug abuse become prominent problems for some individuals. Heroin is one of the most potent euphorogenic agents known. Although the lifestyle of individual heroin users in both the suburbs and cities may differ substantially, certain common features have been identified (Stimmel 1975; Barr et al. 1976). Most of these persons have had an impoverished family relationship marked by the separation of parents, often with the absence of a strong father figure. NDACP (National Institute on Drug Abuse 1980) data show that over 60 percent of heroin users experience broken homes before the age of 12. Frequently alcoholism or drug use prevails in the family, and the future heroin user is usually overtly unhappy and unable to tolerate frustration. In this setting heroin at times may be used as a relief from misery rather than a source of pleasure. With continued use of heroin, however, anxiety is transiently alleviated, and if a constant source of heroin is assured, a fragile equilibrium with the environment is established. Loss of this euphorogenic effect may destroy this relationship and, depending on predisposing factors, result in alcoholism.

Social/Psychological Characteristics of Alcohol/Heroin Addicts

Barr et al. (1976), in their study of problem drinking in narcotics addicts, have noted significant differences between the addicts drinking at problem levels and a nonalcoholic addicted group. As children, the alcoholic addicts experienced more difficulty in concentrating in school, often making mistakes by doing things too fast. They more frequently reported having an unhappy childhood and a greater degree of estrangement from the father, which suggests that problem drinkers experience family relationships which are even more fragile than those of nonproblem drinking addicts. Problem drinkers were significantly more likely than other addicts to have come from homes where alcohol use was a prominent issue, and to have close family members who consumed alcohol excessively. Their lifestyles were less frequently stable than nondrinking addicts, and they had a greater likelihood of obtaining income from illegal activities; these individuals evidenced greater arrest records and were more frequently charged with crimes against individuals and property. In short, the lifestyle of these individuals tended to be more deviant than those addicts who did not report any problem with alcohol consumption. Since the personality characteristics of the two groups were not dissimilar, it appears that both alcoholism and narcotic addiction may spring from a similar deviant background.

Robbins and Nugent (1975), in a study comparing heroin addicts from both outpatient and inpatient settings with alcoholic inpatients, suggested that psychological difficulties—particularly feelings of anxiety and depression—were common in both types of dependency. Differences between the alcohol and heroin groups existed in terms of economic and social problems resulting from society's view of heroin addiction rather than differences in the individual users. Not surprisingly, such problems resulted in a rapidly deteriorating lifestyle for the heroin addict. Toler (1975), in a comparison of personal values of alcoholics and addicts through the use of the Rokeach Value Survey, found that the values of these two groups did not vary significantly and were markedly different from results reported from a control population. The one area of difference related to feelings of self-reliance and self-sufficiency, with addicts scoring higher on the independent value than alcoholics. These traits have been emphasized by Dudley et al. (1974) who compared profiles of addicts and alcoholics utilizing a Social Readjustment Rating Questionnaire. The alcoholics were found to be unable to perceive the importance of the psychosocial changes and disruption that their drinking created, being much more passive-aggressive and depressive. Addicts, on the other hand, were found to be more independent and aware of the impact of addiction on lifestyle.

Kissin (1973), while noting that alcoholics and drug addicts have similar psychological characteristics, has demonstrated differences with respect to age, lifestyle, and social sophistication. These similarities and differences become important when attempting to formulate therapy for treatment of alcoholism and will be discussed in a subsequent section.

Upon entering methadone maintenance, the previously established levels of tolerance established by heroin are maintained. The methadone prevents withdrawal, allowing the former addict to divert his/her energies from the constant search for heroin. The establishment of high levels of tolerance through methadone prevents illicit heroin from producing euphoria, thereby eliminating its ability to provide relief from anxiety. Anxieties now begin to surface as the individual is confronted, often for the first time in years, with a need to reassess his/her life situation and develop meaningful relationships and goals. In many instances these same anxieties may have initiated alcohol and later heroin use. In a search for a substitute to relieve such tensions, alcohol may be consumed in increasing quantities, resulting in the rapid establishment of alcohol dependency.

Alcoholism Defined

Since the heroin addict who also consumes excessive quantities of alcohol represents a point on a continuum, it becomes important to recognize the existence of or potential for excessive alcohol use at an early stage, so that treatment may be instituted.

Over the years there have been many definitions of alcoholism. In general, chronic alcoholism can be said to exist in the presence of: (1) repetitive drinking of alcoholic beverages to an extent that exceeds customary dietary use; (2) disruption of interpersonal relationships and social functioning; (3) impairment of vocational productivity; (4) observed developmental loss of control over drinking patterns; and (5) evidence of physiologic changes attributable to increased alcoholic intake.

The recognition of any of these characteristics in association with drinking can easily allow for the diagnosis of excessive intake. Unfortunately, the blurred distinctions on the continuum between the social drinker and the chronic alcoholic make diagnosis quite difficult. Persons with a potential for alcoholism, as well as those unaware individuals who actually are excessive drinkers but present none of the signs listed above, must be identified. Clinically, the most helpful finding in this regard is a preaddiction history of alcohol consumption. This may also serve as a prognostic sign as to whether alcoholism will appear after detoxification from methadone. O'Donnell (1969), in his 11-year followup of 266 narcotic addicts, found that of those individuals with prenarcotic drinking histories, 30 percent were alcoholic and 7 percent drug addicted. Of those without evidence of prenarcotic alcoholism, 7 percent were alcoholic, whereas 41 percent were addicted to narcotics.

Clinical observation and careful review of past alcohol and substance abuse, while essential, do not in themselves provide sufficient information for the detection of alcoholism. Additional techniques have been developed through the use of psychological testing as well as biochemical analysis.

Psychological Testing

Selzer (1971) developed a series of behaviorally descriptive statements in 1967 that were found to be effective as a screening test for the detection of excessive alcohol use. Termed the Michigan Alcoholism Screen Test (MAST), it was subsequently modified by Swenson and Morse (1975) into a 34-item questionnaire in a yes/no format, permitting a relatively easy administration by either the patient or a mental health worker. This self-administrating alcohol screening test (SAAST) has been shown to be useful in identifying alcoholic patients within a general clinic population. Until recently, however, no one has attempted to use either the MAST or the SAAST as screening devices in addict populations.

Siassi and Alston (1976) tested the validity of the MAST in 125 patients enrolled in methadone maintenance. The MAST scores were compared with the chemical ratings of treatment staff. Forty-six percent of the patients tested scored in the alcoholic range, while 34 percent of the patients were diagnosed as alcoholic by the staff. There was a 75 percent agreement between the MAST findings and the staff ratings ($p<.001$), suggesting the effectiveness of the MAST in detecting alcohol abuse in this treatment modality.

Cohen et al. (1976) used a modified SAAST to screen three groups of narcotic-dependent persons on methadone maintenance: 30 individuals with a known problem of alcoholism, 30 individuals with no history or signs of alcoholism, and 80 persons who initially denied any problems associated with excessive drinking on entering the program, but who later became problem drinkers. The ability of the modified SAAST to separate the alcoholic from the nonalcoholic addict was confirmed ($p<.001$). This test was also found to have a considerable predictive value in identifying those individuals who became problem drinkers. Fifty-seven percent of those persons who denied having a history of alcohol consumption and yet who scored high on the SAAST became problem drinkers; only 8 percent of individuals with low scores did so ($p<.001$).

Other psychological tests have also been used to identify the presence of alcoholism in persons on methadone maintenance. Maddux and Elliott (1975) found that methadone maintained patients who were problem drinkers scored higher on the Zung Depression Scale than those without problems. Lang et al. (1972) found that a combination of the Zung Scale and the Bender Motor Gestalt Test differentiated 17 out of 34 patients whose progress on a methadone program was considered unsatisfactory relative to the consumption of alcohol.

Laboratory Analysis

Biochemical tests are frequently used to diagnose the presence of alcoholism. Unfortunately, the tests used to date have been generally unsatisfactory. Detection of chronic alcohol use through blood alcohol levels or with a breath analyzer will be ineffective for many heavy drinkers since alcohol may be absent from the blood after relatively brief periods of abstinence. Further, the presence of alcohol in the blood does not distinguish acute from chronic alcohol consumption (Hamlyn 1975). Abnormal serum enzymes indicative of hepatic dysfunction are frequently attributed to consumption of alcohol. While alcoholism may produce liver disease manifested by abnormalities in these enzymes, the high prevalence of abnormal hepatic dysfunction in narcotic addicts related to the existence of chronic hepatitis makes identification of hepatic enzymes as a marker for alcoholism less than valuable. Specific serum enzymes such as glutamic dehydrogenase and gamma glutamyl transpeptidase are considered to be more specific to alcoholic liver disease; however, they are elevated in only a portion of heavy drinkers and may be elevated in patients with nonalcoholic liver disease (Rollason et al. 1972; Konttinen et al. 1970).

Recently Shaw et al. (1976) described a characteristic abnormality of plasma amino acids related to chronic and recent alcohol consumption consisting of an increase in the ratio of plasma alpha amino-n-butyric acid and plasma leucine (A/L). In an experimental model of alcohol feeding in baboons, the A/L was found to be elevated with results reproducible regardless of nutritional factors. Clinical studies found elevations in the majority of alcoholics assessed by several diagnostic criteria in both hospitalized and ambulatory settings—independent of the presence of either malnutrition or liver disease (exclusive of active chronic hepatitis, acute type A hepatitis, and advanced cirrhosis).

The A/L ratio was also determined for a population of 25 methadone maintenance patients and compared to three separate criteria for alcoholism: (1) National Council on Alcoholism (NCA) criteria, (2) average alcohol intake, and (3) test scores of the modified SAAST. There was a statistically significant positive correlation between the ratio and each of these criteria, with elevation noted in 16 of 18 alcoholics fulfilling major NCA criteria and sampled within 1 week of drinking. Only one false-positive test was noted. No correlation was seen between positiveness of A/L ratio and presence of abnormal serum chemistries. This test was found to be more sensitive in detecting alcoholics among methadone patients than blood alcohol measurements even though the population was under little pressure to abstain for the day preceding the examination. Although the use of this test as a diagnostic tool is in the preliminary stage, existing data suggest that the A/L ratio may be especially important in detecting active alcohol consumption in narcotic-dependent populations where mild to moderate hepatic dysfunction is prevalent. This test may also be of value in following the course of alcoholism during therapy as the level of AANB/leucine is increased by chronic and recent alcohol consumption of 2 to 4 weeks, since this level will revert to normal during a 2-week period of abstinence.

Summary

Both psychological and biochemical tests exist to help identify the methadone maintained patient who is a problem drinker. However, it cannot be emphasized strongly enough that every effort should be made to also identify those persons who potentially may consume excessive quantities of alcohol. Treatment staff aware of this potential should begin intensive preventative counseling so that the progression toward alcoholism is slowed or altogether aborted.

THERAPY

Alcohol therapy for persons maintained on methadone is a rather formidable undertaking. The background of these individuals suggests that the drinking addict is one whose addiction is deeply rooted within his/her personality structure. In certain ways this individual resembles a nonnarcotic alcoholic more than a nondrinking narcotic addict. Although intensive and comprehensive therapy is needed, the author's clinical experience has shown that attempts to place such persons in therapeutic alcohol facilities have met with little success.

Alcoholics Anonymous (AA), one of the most prominent treatment groups, has consistently refused to accept methadone maintenance patients for treatment. The AA concept—that the only acceptable approach is abstinence from all medications—precludes participation from methadone patients. Although these individuals will be accepted subsequent to detoxification from methadone, most methadone patients, remembering the hazards of illicit heroin use, are unwilling to become detoxified in order to enter the AA setting. Similar organizations such as Synanon and Al Anon are also reluctant to accept the methadone patient.

Referral of narcotic addicts to therapeutic programs dealing primarily with alcoholism is also usually met with a good deal of practical resistance on the part of both patients and staff of alcohol programs. Client differences in age and self-concept (as emphasized earlier in reviews of Toler 1975 and Dudley et al. 1974) do not allow for a ready integration of narcotic addict and alcoholic. However, it might be hypothesized that, in the treatment setting, psychological differences between the narcotic addict and the alcoholic may present advantages for combined alcohol therapy. The alcoholic is usually described as a passive-aggressive, depressed individual who in the therapeutic setting is often guilty and contrite, appearing to have strong motivation to resolve his/her drinking problem. In contrast, the heroin addict appears manipulative and aggressive. If these two personalities could be successfully integrated in therapy, each might complement the other's weaknesses. The alcoholic may benefit from exposure to the younger, more self-assured narcotic addict, who in turn may have his/her hostility moderated by exposure to the more mature, compliant alcoholic. The possibility of achieving a mutually beneficial effect has been discussed by Ottenberg and Rosen (1971). In a review of 1½ years of combined therapy affecting 484 alcoholics and 201 addicts, they found that initial divisiveness among groups eventually gave way to successful therapeutic efforts. The retention rate of alcoholics in joint treatment was 59 percent as compared to 56 percent in preceding years, suggesting greater therapeutic progress.

As with narcotic addicts, methadone patients have been resisted in alcohol treatment programs. Clinic experience shows that personality characteristics of the latter more closely resemble those of nonnarcotic alcoholics. However, the therapeutic setting may enhance existing tendencies toward impulsive and boisterous behavior, creating resentment in the alcoholic patient. Then too, treatment staff—accustomed to a drug-free approach and unfamiliar with methadone—may have difficulty with the methadone patients' acting-out behavior. As a result, except for admission for detoxification, few facilities exist which will accept alcoholics maintained on methadone maintenance for ongoing therapy. This resistance is often a byproduct of frustration following unsuccessful attempts to rehabilitate the methadone maintained patient. It can be hypothesized, however, that such attempts can be made more effective if all physical and social psychological needs are appropriately addressed in treatment. Specific methods for meeting these needs are described below.

Existing Resources for the Therapy of Alcoholism

The steps to follow in treating the alcoholic methadone patient are similar to those required by the nonnarcotic addict alcoholic and consist of: (1) management of acute intoxication directed at overcoming the immediate effects of alcohol; (2) correction of any pressing physical infirmities related to alcoholism; and (3) therapy to affect the long-term behavior. It must be emphasized that, considering the increasing experimental evidence suggesting the potential lethality of combined alcohol and narcotic use, any person coming into a methadone clinic acutely intoxicated with alcohol should not be given his/her daily methadone dose. Chronic consumption of alcohol should be monitored through daily clinic visits and a lowering of methadone maintenance dose so as to diminish the chances of an overdose reaction when the usual intakes of methadone or alcohol are consumed within shorter-than-usual periods.

Although detoxification from methadone has been advocated for patients who become alcoholics in the course of treatment, this approach is not appropriate for several reasons. First, essential therapeutic contact with the patient is thereby terminated. Further, return to illicit heroin use—a significant risk in such cases—will expose the person to the dangers of illicit injection as well as create fluctuating blood levels of narcotics which may make an overdose reaction more likely. It is far more preferable to attempt to detoxify the person from alcohol as an immediate step, then proceed to work intensively with him/her to overcome the drinking problem. It should be remembered that even a mean dose of 5 mg per day assures continued attendance in the clinic and, therefore, continued staff-patient contact.

Detoxification from alcohol within the methadone clinic requires an assessment of the individual's status at the end of treatment. It therefore becomes essential to design a therapeutic modality to monitor and help the alcoholic methadone maintained person throughout his/her program. At present there are several modes of therapy for the treatment of alcoholism that may be utilized by staff in methadone clinics; a brief description of each of these follows.

Therapy Modes

DISULFIRAM (ANTABUSE)

Hald and Jacobson (1948) noted that an analogue of thivram termed disulfiram (subsequently called Antabuse) would produce a marked intolerance to alcohol, with the strength of the reaction depending upon the amount of the drug taken as well as the quantity of alcohol consumed. The use of disulfiram is now widespread since the drug, when administered in appropriate dosages, has proven to be a safe and effective deterrent to drinking (Fox 1967). Several studies utilizing disulfiram in patients on methadone maintenance have found the agent to be useful for controlling alcoholism in drug addicts. However, in order to insure that clients will take this medication, it is necessary to dispense it at the same time as methadone. When patients with take-home medication privileges are allowed to take disulfiram in the home setting, compliance is usually minimal. Liebson, in a study of alcoholic methadone maintained patients given disulfiram daily in the clinic as compared to a comparable group provided with the medication and instructed in its daily use, found that the number of drinking days for the self-administering group averaged 17 percent of total treatment days as compared to 1 percent for the group receiving disulfiram in the clinic setting. Although each day's drinking as recorded on the treatment chart resulted in a mild disulfiram reaction in the first group, no such reaction was noted in the second group, since the medication would always be discontinued several days before drinking (Liebson and Bigelow 1972).

The effect of patient cooperation was also studied by Bihari and Bashkow (1976) in a much larger study of disulfiram use by patients enrolled in the New York City methadone maintenance program. Of those patients offered disulfiram therapy, approximately one-third refused this medication, one-third initiated the program and dropped out within a relatively short period of time, and one-third stayed in the program. In the group that stayed in the program, a favorable alteration of drinking patterns was noted. In observing these trends, it should be stressed that use of disulfiram does not affect the cause of the drinking any more than methadone alleviates the personality disorders associated with heroin dependency. The use of this agent may, however, enable the patients to maintain the degree of sobriety necessary to effect the continuation of more intensive therapy.

Ingestion of disulfiram is not without hazard and cannot be recommended for patients with a history of heart disease, psychotic persons, or pregnant women. Continued drinking on disulfiram may result in significant neurologic and psychologic changes due to increased levels of acetaldehyde. In addition, patients under disulfiram treatment must be warned about alcohol contained in medicines or foods, as well as the dangers of inhalation of alcohol fumes from varnish or shellac when these substances are used in a closed area.

In addition to its side effects, disulfiram, when taken concomitantly with other agents, may result in drug interactions. Disulfiram is rapidly absorbed from the gastrointestinal tract. Due to its high lipophilic activity, its maximum action may not occur for up to 12 hours, and elimination is relatively slow; most of the drug is oxidized in the liver and subsequently excreted in the urine. The hepatic effects of disulfiram may interfere with the metabolism of other drugs, resulting in a greater potential for clinical toxicity of these agents. Such interactions have been described for the concomitant use of diphenylhydantoin (Dilantin), oral anticoagulants, and isoniazid. Since metabolism of methadone also occurs in the liver, one might expect an interaction between methadone and disulfiram. However, little data have been published in the literature with respect to such interactions, and that clinical relevance remains to be determined.

Charuvastra et al. (1976), in a study of eight methadone maintenance patients given Antabuse, were not able to demonstrate any differences in hematological parameters or blood chemistry tests for up to 16 months of combined therapy, with the exception of serum glutamic oxaloacetic transaminase (SGOT) values. The SGOT values which were elevated revealed a progressive return to normal, suggesting the discontinuance of alcohol consumption. Since no work has been published concerning plasma methadone levels in patients given disulfiram, it is entirely possible that fluctuations in plasma levels of methadone may occur. All such patients should be carefully monitored upon initiation of disulfiram therapy to assure that a change in methadone dose is not needed.

ABSTINENCE

There is no question that abstinence is the optimal approach with respect to alcoholism, as it is with respect to heroin use. Unfortunately, although abstinence from alcohol may be an effective approach for some individuals, it is clearly an inappropriate solution for all segments of the alcoholic population. There is no reason to expect that alcoholic patients on methadone maintenance would accept abstinence to any greater degree than nonnarcotic dependent alcoholics. For example, it has been estimated that of the 9 million alcoholics, only approximately 5 percent are members of Alcoholics Anonymous (Gottheil 1976). Even among the 5 percent, however, there are many who are not able to abide by the AA principles of abstinence and cannot be reached. The percent of individuals on methadone who would be unamenable to an abstinence approach would be expected to be higher, since this population has selected a maintenance program rather than a drug-free approach as the current therapeutic modality for treatment of the heroin dependency.

CONTROLLED DRINKING

The controversy between abstinence versus controlled drinking as a therapeutic modality in the management of alcoholism has continued for many years. The advocation of abstinence as the only effective approach to therapy of alcoholism has been based on the physiologic "loss of control" hypothesis, viz, drinking any amount of liquor will, in an alcoholic, lead to further uncontrolled drinking. While this may certainly be true of many alcoholics, it does not seem logical that the loss-of-control concept would hold for all. Engle and Williams (1972) randomly assigned 20 of 40 alcoholics to a group receiving 1 ounce of vodka disguised in a strongly flavored vitamin mixture. Half of the 20 were then told that they had received the vodka. These investigators found that there was no relationship between consuming a single drink and an increased desire for alcohol; rather, an increased desire followed the receipt of information that alcohol had been consumed.

Recently, evidence has appeared in the literature supporting the possibility of a controlled drinking approach in the treatment of chronic alcoholism. Paredes et al. (1969) found that only 3 of 66 alcoholic patients exhibited a craving for additional drinks after they had taken "authorized drinks" in the course of the study. Mello (1972) has also gathered evidence against the belief that one drink will lead to uncontrolled drinking. Davies (1962) noted that 793 individuals given brief psychotherapy had maintained moderate social drinking patterns for followup periods of up to 11 years. A similar percentage of patients, according to Gerard and Saenger (1966), maintained patterns of limited alcohol consumption at 1-year followup. Pattison (1968), in a literature review on controlled drinking, estimated that between 4 percent to 10 percent of alcoholics may ultimately become social drinkers. Emerick (1975), reviewing 384 studies of psychologically oriented alcoholism treatment, showed that differences in treatment methods did not significantly affect long-term outcome. The mean abstinence rates did not differ between treated and nontreated alcoholics.

Skuja et al. (1976) reviewed the effectiveness of therapy in 563 servicemen referred to a Navy alcohol recovery program over a 2-year period. Not surprisingly, of those considered ineffective in their job performance, 84 percent were drinking at 6-month's followup. Of those rated effective, however, 59 percent of younger (25 years of age or younger) subjects and 42 percent of older (over 25 years of age) subjects were still drinking. At the end of a 12-month period, 77 percent of the younger effective subjects and 44 percent of the older effective subjects were still consuming variable amounts of alcohol. These findings suggest that complete abstinence may not be a realistic or even a necessary goal for the achievement of social productiveness.

The most recent controversial study concerning the effects of controlled drinking was conducted by the Rand Corporation (Armor et al. 1976). This survey followed a sample of 1,340 alcoholics for 8 to 18 months after entering a treatment program. The relapse rate was no higher among those who drank than among those who were complete abstainers. Persons who remained for only one treatment session had a 50 percent remission rate at followup; those with more extensive treatment, on the other hand, had a remission rate of only 20 to 25 percent. It should be noted that this study suffered from many limitations, the most prominent being the aggregating of data from many different centers, resulting in an absence of randomization and uniformity of therapeutic interventions.

A better designed, extensive test of controlled drinking was performed by Sobell and Sobell (1976), who randomly assigned alcoholics who qualified for controlled drinking to either behavioral modification with moderation in drinking as a goal, or to traditional therapy with abstinence as a goal. Outcome was judged on the basis of a 2-year followup which included assessment of drinking patterns and various sociological indicators of adequate daily functioning. The controlled drinkers were found to have functioned best in several indicators, including number of days abstinent.

BEHAVIOR THERAPY

Hamburg (1975) and Pomerleau et al. (1976) have comprehensively reviewed the use of behavioral therapy in alcoholism. Therapies diagnosed as effective included pretreatment identification of cues triggering excessive drinking, with subsequent education of the patient for the identification of high-risk situations in connection with broad spectrum behavioral counseling. Such treatment techniques may use family therapy and videotaping during the alcoholic state.

Application of Therapeutic Techniques to Methadone Programs

It should be emphasized that, in treating the alcoholic methadone maintained patient, there is no need to promote any particular form of therapy to the exclusion of others. A comprehensive program should be tailored to suit an individual's needs and offer the possibility of supportive environments, psychotherapy, crisis intervention, abstinence, or controlled drinking. The advantage of utilizing a broad-base approach has been emphasized by several investigators. Costello (1975) noted that the broader the range of treatment resources, the greater the chance of a favorable outcome. Important variables noted by his study were collateral counseling, psychotherapy, disulfiram use, and the services of Alcoholics Anonymous. Emerick (1975), in a survey of 384 publications dealing with alcoholism treatment, noted that, although abstinence rates did not differ between treated and nontreated alcoholics, more treated than nontreated alcoholics improved, suggesting that formal treatment of any kind increased an alcoholic's chance of reducing his drinking problem. Kissin (1972) found that the rate of success directly correlated with the number of therapeutic modalities available. Those patients treated with three available modalities were more successful than those patients with only two modalities, who in turn had more successful outcomes than those offered only one type of therapy.

Methadone programs should therefore establish comprehensive alcoholism treatment plans which can provide patients with the most suitable form of therapy. The techniques used will vary, depending upon individual needs and the medical status of the patient (which may contraindicate a specific type of therapy). Many patients, especially those with alcoholic liver disease, will have abstinence as a therapeutic goal in combination with one or more other therapeutic modalities. However, a considerable number may also benefit from a controlled drinking approach in association with behavioral modification therapy.

FINAL SUMMARY

Excessive consumption of alcohol in persons on methadone maintenance is a problem of considerable magnitude. There is no evidence, however, to support the notion that methadone is an etiologic factor which produces problem drinking, or that excessive alcohol consumption or alcoholism is any greater in this population than in a matched group of nonmethadone dependent persons. The effects of alcoholism in persons on methadone programs are considerable and may result in severe and even fatal medical complications, as well as interruption of the rehabilitative process and administrative discharge from methadone maintenance.

Since facility choices for the treatment of alcoholics are far from optimal, it is essential to identify the problem drinker as early as possible to prevent a progression to alcoholism. Diagnosis can be aided by both psychological and biochemical tests. Once identification has occurred, treatment should be tailored to the individual's needs. Advantage should be taken of all appropriate and available modalities, including controlled drinking when indicated. In sum, the treatment of the alcoholic methadone patient may not be more successful than that seen in the nonnarcotic alcoholic, but it need not be less so.

REFERENCES

Armor, D. G.; Polich, G. M.; and Stambul, H. B. *Alcoholism and Treatment.* Santa Monica, Calif.: The Rand Corporation, 1976.

Baden, M. M. Homicide, suicide and accidental death among narcotic addicts. *Human Pathology,* 3:91-95, 1972.

Baden, M. M. Methadone related deaths in New York City. *International Journal of the Addictions,* 5:489-498, 1970.

Barr, H. L., and Cohen, A. The problem drinking drug addict. In: Gardner, S. E., ed. *The National Drug/Alcohol Collaborative Project: Issues in Multiple Substance Abuse.* DHEW Pub. No. (ADM)80-957. Washington, D.C.: Supt. of Docs., U.S. Govt. Print. Off., 1980.

Barr, H. L.; Cohen, A.; Hannigan, P. In: Problem drinking by drug addicts and its implications. National Council on Alcoholism. *Proceedings of National Council on Alcoholism, May, 1976.* Rockville, Md: the Council, 1976.

Bihari, B. Alcoholism and methadone maintenance. *American Journal of Drug and Alcohol Abuse,* 1:79-89, 1974.

Bihari, B., and Bashkow, S. "Results of one year's experience with the use of Antabuse in a methadone maintenance treatment program."Paper presented at Third National Drug Abuse Conference, New York, March 25-29, 1976.

Bloom, W. A., and Butcher, B. T. Methadone side effects and related symptoms in 200 methadone maintenance patients. In: National Association for Prevention of Addiction to Narcotics. *Proceedings of the Third National Conference on Methadone Treatment.* New York: the Association, 1970.

Blum, K.; Wallace, J. E.; and Schwerler, H. A. Morphine suppression of ethanol withdrawal in mice. *Experientia,* 32:79-8l, 1976.

Brown, B.; Kozel, N.; Myers, M.; and DuPont, R. Use of alcohol by addict and nonaddict populations. *American Journal of Psychiatry,* 130:599-601, 1973.

Brunswick, A. Health and drug behavior: a study of urban black adolescents. *Addictive Diseases,* 3:197-214, 1977.

Chambers, C. D.; Babst, D. V.; and Warner, A. Characteristics of patient retention/attrition. In: Chambers, C. D., and Brill, L., eds. *Methadone: Experiences and Issues.* New York: Behavioral Publications, 1973.

Charuvastra, C. V.; Panell, J.; Hopper, M.; Ehrmann, M.; Blakis, M.; and Ling, W. The medical safety of the combined usage of disulfiram and methadone. *Archives of General Psychiatry,* 33:391-394, 1976.

Cherubin, C.; McCusker, J.; and Baden, M.M. The epidemiology of death in narcotic addicts. *American Journal of Epidemiology,* 96:11-22, 1972.

Cohen, A.; McKeever, W.; Cohen, M.; and Stimmel, B. "The use of alcoholism screening test to identify the potential for alcoholism in persons on methadone maintenance." Paper presented at Third National Drug Abuse Conference, New York, March 25-29, 1976.

Costello, R. M. Alcoholism treatment and evaluation: in search of methods: I. Collation of two-year follow-up studies. *International Journal of the Addictions,* 10:857-867, 1975.

Davies, D. L. Normal drinking in recovered alcoholics. *Quarterly Journal of Studies in Alcohol,* 23:94-104, 1962.

Drug Enforcement Administration. *Drug Enforcement Statistical Report.* Washington, D.C.; U.S. Department of Justice, 1974.

Dudley, D. D.; Roszell, D. K., Myles, J. E. Heroin versus alcohol addiction: quantifiable psychosocial similarities and differences. *Journal of Psychosomatic Research,* 18:327-335, 1974.

Eerola, R.; Venho, I.; Vartiainen, O., Venho, E. V. Acute alcoholic poisoning and morphine. *Annales Medicinae Experimentalis et Biologiae Fenniae,* 33:253-258, 1955.

Emerick, C. D. A review of psychologically oriented treatment of alcoholism: II. The relative effectiveness of different treatment approaches and the effectiveness of treatment versus no treatment. *Journal of Studies on Alcohol,* 36:88-108, 1975.

Engle, K. B., and Williams, T. K. Effect of an ounce of vodka on an alcoholic's desire for alcohol. *Quarterly Journal of Studies on Alcohol,* 33:1049-1055, 1972.

Force, E. E., and Miller, J. W. Liver diseases in fatal narcotism: role of chronic disease and alcohol consumption. *Archives of Pathology,* 97:166-169, 1974.

Fox, R. Disulfiram (Antabuse) as an adjunct in the treatment of alcoholism. In: Fox, R., ed. *Alcoholism-Behavior Research: Therapeutic Approaches.* New York: Springer Publishing Co., 1967.

Garriott, J. C., and Sturner, W. Q. Morphine concentrations and survival periods in acute heroin fatalities. *New England Journal of Medicine,* 289:1276-1278, 1973.

Gearing, F. R. Evaluation of methadone maintenance treatment programs. *International Journal of the Addictions,* 5:517-543, 1970.

Gerard, D. L., and Saenger, G. *Out-patient treatment of alcoholism: a study of outcome and its determinants.* Toronto: University of Toronto Press, 1966.

Gottheil, E. Advantages and disadvantages of the abstinence goal in alcoholism. *American Journal of Drug and Alcohol Abuse,* 3:13-23, 1976.

Hald, J., and Jacobsen, E. Drug sensitizing organism to ethal alcohol. *Lancet,* 28:1001-1004, 1948.

Hamburg, S. Behavior therapy in alcoholism: a critical review of broad-spectrum approaches. *Journal of Studies on Alcohol,* 36:69-87, 1975.

Hamlyn, A. N.; Sherlock, S.; Brown, A. J.; Baron, D. N. Casual blood ethanol estimations in patients with chronic liver disease. *Lancet,* 2:345, 1975.

Ho, A. K. S.; Chen, R. C. A.; and Morrison, J. M. Opiate-ethanol interaction studies. In:Blum, K., ed. *Alcohol and Opiates: Neurochemical and Behavioral Mechanisms.* New York: Academic Press, 1977.

Ho, A. K. S.; Chen, R. C. A.; and Morrison, J. M. Potential interactions between narcotics and narcotic antagonists with ethanol. In: Braude, M. C., and Vessel, E. S., eds. *Interactions of Drugs of Abuse.* New York: New York Academy of Sciences, 1977.

Jackson, G. W., and Richman, A. Alcohol use among narcotic addicts. *Alcohol World,* 1:25-28, 1973.

Johnston, W., and Williams, H. R. Abstinence-relapse patterns among heroin addicts receiving methadone treatment on an outpatient basis. In: National Association for the Prevention of Addiction to Narcotics. *Proceedings of the Third National Conference on Methadone Treatment.* New York: the Association, 1970.

Kissin, B. Selective factors in treatment choice and outcome in alcoholics. In: Mello, N. I., and Mendelson, J. H., eds. *Recent Advances in Studies of Alcoholism.* Washington, D.C.: U.S. Government Printing Office, 1972.

Kissin, B. Which addicts and alcoholics should be treated together and which separately? In: Ottenberg, D., ed. *Proceedings of the Sixth Annual American Eagleville Conference, 1973* Rockville: ADAMHA, 1973.

Knupfer, G. The epidemiology of problem drinking. *American Journal of Public Health,* 57:973-986, 1967.

Kolb, L., ed. *Types and Characteristics of Drug Addicts in Drug Addiction.* Springfield, Illinois, Charles C Thomas, 1962.

Konttinen, A.; Hartel, G.; and Louhija, A. Multiple serum enzyme analysis in chronic alcoholics. *Acta Medica Scandinavia,* 188:257-265, 1970.

Kreek, M. J. Medical safety and side effects of methadone treatment. In: National Association for Prevention of Narcotics Addiction. *Proceedings of Fifth National Conference on Methadone Treatment.* New York: the Association, 1973.

Lang, P.; Stimmel, B.; and Brown, F. Psychological testing as a predictive index of success in methadone maintenance treatment of heroin addiction. In: National Association for Prevention of Addiction to Narcotics. *Proceedings of Fourth National Conference on Methadone Treatment,* New York: the Association, 1972.

Liebson, I., and Bigelow, G. A. Behavioral-pharmacological treatment of dually addicted patients. *Behavior Research and Therapy,* 10:403-413, 1972.

Liebson, I.; Bigelow, G.; and Flamer, R. Alcoholism among methadone patients: a specific treatment method. *American Journal of Psychiatry,* 130: 483-485, 1973.

Maddux, J. F., and Elliott, B. Problem drinkers among patients on methadone. *American Journal of Drug and Alcohol Abuse,* 2:245-254, 1975.

Mello, N. K. Behavioral studies in alcoholism. In: Kissin, B., and Begleiter, H., eds. *The Biology of Alcoholism,* Vol. 2. New York: Plenum Press, 1972.

Mezritz, M. G.; Slobetz, F.; Kleber, H.; and Riordan, C. A follow-up study of successfully detoxified methadone maintenance patients. In: Senay, E.; Shorty, V.; and Alksne, H. eds. *Developments in the Field of Drug Abuse.* Cambridge: The Shenkman Publishing Company, 1975.

National Institute on Drug Abuse. *Client Oriented Data Acquisition Process (CODAP): Statistical Series Quarterly Reports, April-June 1976.* Rockville, Md.: the Institute, 1976.

National Institute on Drug Abuse. *National Drug/Alcohol Collaborative Project: Issues in Multiple Substance Abuse,* Gardner, S. E., ed. DHEW Pub. No. (ADM)80-957. Washington, D.C.: Supt. of Docs., U.S. Govt. Print. Off., 1980.

Nichols, J. R., and Hsiao, S. Addiction liability of albino rats: breeding for quantitative differences in morphine drinking. *Science,* 157:561-563, 1967.

Nightingale, S. Treatment for drug abusers in the United States. *Addictive Diseases,* 3:11-20, 1977.

O'Donnell, J. A. *Narcotic Addicts in Kentucky.* Washington, D.C.: U.S. Government Printing Office, 1969.

Ottenberg, D. J., and Rosen, A. Merging the treatment of drug addicts into an existing program for alcoholism. *Quarterly Journal of Studies on Alcohol*, 32:94-103, 1971.

Paredes, A.; Ludwig, K.; Hassenfeld, F.; and Cornelison, F. A clinical study of alcoholics using audiovisual self-image feedback. *Journal of Nervous and Mental Disease*, 148:449-456, 1969.

Pattison, E. M. Abstinence and normal drinking: an assessment of drinking patterns in alcoholics after treatment. *Quarterly Journal of Studies on Alcohol*, 29:610-633, 1968.

Perkins, M. E., and Bloch, H. L. Survey of a methadone treatment program. *American Journal of Psychiatry*, 126:33-40, 1970.

Pomerleau, O.; Pertschuk, M.; and Stinnet, J. A critical examination of some current assumptions in the treatment of alcoholism. *Journal of Studies on Alcohol*, 37:849-867, 1976.

Preble, E., and Miller, T. Methadone, wine and welfare. In: Weppner, R., ed. *Ethnography of Drugs and Crime*, New York: Russell Sage Foundation, 1977.

Robbins, P. R., and Nugent, J. F. Perceived consequences of addiction: a comparison between alcoholics and heroin addicted patients. *Journal of Clinical Psychology*, 31:(2):367-369, 1975.

Robins, I. N., and Guze, S. B. "Drinking practices and problems in urban ghetto populations." Paper presented at Recent Advances in Studies of Alcoholism Conference, National Center for Prevention and Control of Alcoholism, Washington, D.C., June 27, 1970.

Roizin, L. "Interactions of methadone and ethanol." Paper presented at the 1969 Meeting of the Eastern Section of the American Psychiatric Association, New York, 1969.

Rollason, J. G.; Pincherle, G.; and Robinson, D. Serum Gammaglutamyl transpeptidase in relation to alcohol consumption. *Clinica Chimica Acta*, 39:75-79, 1972.

Rosen, A.; Ottenberg, D. J.; and Barr, H. L. Patterns of Previous Abuse of Alcohol in a Group of Hospitalized Drug Addicts. *Drug Forum*, 4:261-272, 1975.

Schut, J.; File, K.; and Wohlmuth, T. Alcohol use by narcotic addicts in methadone maintenance treatment. *Quarterly Journal of Studies on Alcohol*, 34:1356-1359, 1973.

Scott, N. R.; Winslow, W. W.; and Gorman, D. G. Epidemiology of alcoholism in a methadone program. In: National Association for the Prevention of Addiction to Narcotics. *Proceedings of the Fifth National Conference on Methadone Treatment.* New York: the Association, 1973.

Selzer, M. L. The Michigan Alcoholism Screening Test (MAST): the quest for a new diagnostic instrument. *American Journal of Psychiatry*, 127:1653-1658, 1971.

Shaw, S.; Stimmel, B.; and Lieber, C. S. Plasma Amino-n-Butyric Acid/Leucine: A Biochemical Marker of Alcohol Consumption. Application for the Detection and Assessment of Alcoholism. In: Sexas, F., ed. *Currents in Alcoholism*. New York: Grune & Stratton, 1976.

Siassi, I., and Alston, D. C. Methadone maintenance and the problem with alcohol. *American Journal of Drug and Alcohol Abuse*, 3:267-277, 1976.

Simpson, D. D., and Savage, L. J. *Use of Alcohol by DARP Patients in Treatment for Drug Abuse, 1969-1971 Admissions.* IBR Report No. 73-7. Fort Worth: Texas Christian University, 1973.

Skuja, A. T.; Wood, D.; and Bucky, S. F. Reported drinking among post-treatment alcohol abusers: a preliminary report. *American Journal of Drug and Alcohol Abuse*, 3:473-483, 1976.

Sobel, M. B., and Sobel, L. C. Second year treatment outcome of alcoholics treated by individualized behavior therapy: results. *Behavior Research and Therapy*, 14:195-215, 1976.

Stimmel, B. Factors leading to heroin use. In: Stimmel, B., ed. *Heroin Dependency.* New York: Stratton Intercontinental Medical Book Corp., 1975.

Stimmel, B.; Vernace, S.; and Tobias, H. Hepatic dysfunction in heroin addicts: the role of alcohol. *Journal of the American Medical Association*, 222:811-812, 1972.

Swenson, W. M., and Morse, R. M. The use of a Self-administered Alcoholism Screening Test (SAAST) in a medical center. In: *Mayo Clinic Proceedings No. 50.* Rochester, Minn.: Mayo Clinic, 1975.

Toler, C. The personal values of alcoholics' and addicts' addiction: quantifiable psychosocial similarities and differences. *Journal of Clinical Psychology*, 3l:554-557, 1975.

Vaillant, G. E. A 12-year follow-up of New York narcotic addicts IV: some characteristics and determinants of abstinence. *American Journal of Psychiatry*, 123:573-585, 1966.

Venho, I. L.; Eerola, R.; Venho, E. V.; Vartiainen, O. Sensitization to morphine by experimentally induced alcoholism in white mice. *Annales Medicinae Experimentalis et Biologiae Fenniae*, 33:249-252, 1955.

Chapter 4
The Role and Significance of Alcohol and Sedative Use in the Multisubstance Abuser: An Investigation of Two Patient Samples

Lewis L. Judd, M.D.
University of California, San Diego and
San Diego Veterans Administration Medical Center

Dean R. Gerstein, Ph.D.
William G. Lee
Winifred B. Riney
Kenneth I. Takahashi
University of California, San Diego

INTRODUCTION

For thousands of years, substances which have served as effective medical pharmaceuticals have also been the source of a social problem—drug abuse. Opiates, India hemp, rauwolfia, and alcohol were known and employed medicinally long before Biblical times, and even then their potential for abuse was recognized. There now exists for the treatment of disease and injury a pharmaceutical array of staggering proportions. It would follow that the modern psychotropic drugs within this vast pharmacopoeia, especially those producing profound emotional, psychological, and behavioral effects, would come to be abused as had some of the ancient remedies with similar properties. In this regard, one of the developments which most intrigues researchers in the field of substance abuse has been the apparent establishment of a subculture in which heavy drug use, often involving several different types of drugs, is an integral part. And, whether substances are ingested in combination with one another or sequentially, it seems that multiple abuse is far more common than was suspected.

The early literature relating to drug and alcohol abuse was clearly a reflection of the fact that treatment establishments were initially separate and exclusively focused upon a given substance of abuse. Thus, drug-oriented literature focused upon drugs, and alcohol-oriented studies focused upon alcohol. There was little acknowledgment that these two agents could be used by preference simultaneously, and concurrently as well as exclusively. Over the years, however, it became evident that large numbers of the persons labeled single-substance abusers were in fact abusers of more than one substance. As time went on, the alcohol treatment establishment began to agree that it was not uncommon for certain subpopulations of alcoholics to be also engaged in serious and significant abuse of drugs, and at the same time the drug treatment establishment began to note that it was not uncommon for their patients to be engaged in serious alcohol abuse. It was at this time that the term "substance abuse" was coined in order to reduce the polarity between the alcohol and drug abuse constituencies, which had proven to be counterproductive and limiting to the understanding of general abuse patterns. This concept made it possible to look at compulsive substance abusing behavior as a whole and to examine the potential commonalities between those populations whose modal patterns of abuse included alcohol and those whose modal patterns did not.

The San Diego Polydrug Study Unit (SDPSU) has been able to identify a particularly significant pattern of abuse among a group of substance users who were studied between 1973 and 1975. These were individuals who commonly and frequently used alcohol, barbiturate hypnotics, and minor tranquilizers. This pattern of substance preference was intriguing since there is an interesting reciprocal pharmacological relationship between alcohol, hypnotics (both barbiturate and nonbarbiturate), and drugs of the minor tranquilizer class. One of the major behavioral effects common to compounds of these three pharmacological classes is the depressant effect on specific central nervous system functions. It has been hypothesized, and to some extent proven, that the euphoria or "high" derived from use of these compounds is due to a releasing phenomenon secondary to CNS depressant effect. Further, these three classes of compounds exhibit cross tolerance to each other and when used in combination produce a potentiation of effects upon the central nervous system. Thus, it is not surprising that street users of these compounds have found that they can enhance the effects that they are seeking by using these substances in combination. In addition, the cross tolerance between drugs of these classes also allows street users to maintain themselves and to prevent withdrawal symptoms, when addicted to one of these substances, by substituting the use of drugs from the other classes. For example, a street barbiturate addict soon learns that if his supply of barbiturates is interrupted, substitution of minor tranquilizers (e.g., diazepam) and alcohol can effectively maintain the individual until barbiturates become available. This cross tolerance has also been put to medical use, since one of the more commonly accepted methods of detoxification from alcohol is through the use of diazepam (Valium). Thus, given this unusual pharmacological interrelationship, it is not surprising that those drug abusers who prefer CNS depressants often abuse and use substances from these three classes of compounds in combination or in substitution for one another.

To more fully describe this modal abuse pattern, this group of individuals was labeled "mixed substance" abusers. We have shown that this particular patient population does not fare well in the currently established treatment network, since they are seen by alcohol agencies as being drug abusers, by drug agencies as being alcohol abusers, and by mental health agencies as being both (Judd et al. 1978b). It is therefore appropriate that the unique problems of this group be acknowledged and that the treatment system be retooled to accommodate them. To this end, the authors examined two dissimilar data pools in detail and coalesced this information to determine prevalence, significance, and possible distinguishing characteristics of those individuals who combine alcohol and sedative use; an attempt was then made to find characteristics common to this compulsive substance abuse behavior.

The hypothesis of the study was suggested by the clinical observation that certain individuals whose major abuse habits involved heavy alcohol and hypnotic-sedative consumption (barbiturates, nonbarbiturate hypnotics, etc.) were more severely dysfunctional, both psychologically and socially, than other multisubstance abusers. A research design was developed to study these particular mixed-substance abusers and determine whether it was possible to characterize their behavior based only on their consumption patterns. Specifically, then, the working hypothesis was that those mixed substance abusers whose modal abuse patterns include alcohol and barbiturates (sedatives) would prove to be distinguishable psychologically and/or socially from the other categories of polydrug abusers in the population under study.

The data for in-depth analysis of this population came from two sources. The first was a study called the National Drug/Alcohol Collaborative Project (NDACP) which was carried out in various drug/alcohol treatment centers in the United States. As data collection and compilation had already been carried out by NDACP, the authors examined the figures in terms of the basic hypothesis. The second source of information was the San Diego Polydrug Study Project (SDPSU) itself, which had been prospectively designed to answer specific research questions.

Because one of the main goals was to attempt to particularize the drug and alcohol consumption patterns in these two diverse population samples by means of detailed personal histories and interviews, a special effort was made to gather as much information as possible on contemporary as well as lifelong abuse practices for each subject. In addition to these basic data, demographic measures on ethnic, educational, religious, and socioeconomic backgrounds were gathered along with information on marriage, personal income, drug-related arrest rates, and expenses for drug purchases. Although it was not possible to carry out psychiatric examinations or other tests of intellectual or psychosocial functioning on the NDACP sample, this was feasible with the SDPSU population and yielded provocative profiles.

Before the data are formally presented, one specific caveat to the reader should be underscored. As stated above, our original hypothesis was that those individuals whose major abuse patterns include use of barbiturates singly and/or in combination with alcohol are potentially a unique subpopulation among the general drug abusing population. Thus, the analysis of the data presented in this chapter was conducted with the subject sample subdivided on the presence or absence and the levels of alcohol and barbiturate abuse. As will be seen, this subclassification of the sample was successful in establishing specific behavioral and social profiles for the subpopulations divided on this basis. As will be outlined in the chapter, there were a number of distinctive characteristics correlated with the subgroups of alcohol and/or barbiturate use. On the other hand, alcohol/barbiturate drug abuse categories proved to be by no means exclusive in terms of the abuse of other drugs since other substances were used frequently and severely in addition to the alcohol and/or barbiturate abuse. For example, the two categories, barbiturates alone and barbiturates plus alcohol, which proved to be the most extreme in a wide spectrum of behaviors were also found to be more extreme in their drug-abusing behaviors as well. Specifically, individuals in these two groups were significantly more prone to multiple drug use and often were significant users of heroin as well.

NATIONAL DRUG/ALCOHOL COLLABORATIVE PROJECT (NDACP)

Results

In dealing with the NDACP data, the specific focus was to assess whether there were any similarities between sedative and alcohol abuse and whether individuals who by habit abused these substances singly or in combination were in any way different from their peers. The NDACP data were gathered for the 3-month period prior to admission and for the user's lifetime. Categories—derived on the basis of their differentiating characteristics—are as follows: (1) Barbiturate Alcohol Group (BARB + ALC), which used both barbiturates and alcohol regularly; (2) Barbiturate Group (BARB), which used barbiturates regularly; (3) Alcohol Group (ALC), which used alcohol regularly; and (4) NEITHER, which used neither alcohol nor barbiturates regularly.[1] In addition to the substances included in these categories, there were varying degrees of usage of other substances. This method of categorizing sedative and alcohol use, however, had proven to be an effective method of separating and understanding this type of mixed substance abuse in a previous study by the author (Judd 1978a), and the grouping appeared to be equally valid for a more representative national sample. As will be seen, these cohorts comprised only a small percentage of the NDACP sample; nevertheless, being similar to the San Diego groups, they proved useful in furthering the clinical understanding of substance abusers under study.

Demographic and Personal Characteristics

The information in tables 1, 2, 3, and 4 presents the NDACP subjects' responses categorized on the basis of whether they regularly used alcohol and barbiturates in combination, singly, or not at all. These tables present data both for the 3 months prior to admission and for lifetime use. However, since user trends are similar for both time spans, the analysis here will concentrate on 3-month findings only—which reflect the subject's more recent recall and are comparable with SDPSU data for the same period. The materials included in the next four tables are designed to show evidence of how the four different substance categories show variability (or similarity) across a number of demographic and personal characteristics. This empirical presentation speaks largely for itself and will not be repeated in the text other than through highlighting and some summation.

It was surprising to learn that in terms of the entire sample the numerical distribution among the four groups was extremely uneven; the vast majority of the subjects fell in either ALC ($n = 746$) or

---

[1] Regular use denotes use nearly every day for at least a month.

TABLE 1.—*Global demographic characteristics of the NDACP subjects categorized on patterns of regular alcohol/sedative use for 3 months prior to treatment (n = 1,434)*

Demographic characteristics	BARB + ALC (n = 46)	BARB (n = 40)	ALC (n = 746)	NEITHER (n = 602)
Age at admission, in years	27.6	25.1	33.3	26.8
Female percentage	23.9	37.5	17.4	26.7
Mean age left school	17.2	17.7	16.6	16.8
Years of school completed	11.6	11.1	10.1	10.2
Ethnicity, in percent:				
Afro	20.5	5.1	38.2	24.0
Hispanic	11.4	33.3	20.9	28.3
Other	6.8	33.3	10.2	9.8
Anglo	61.4	28.2	30.7	37.9
Mean monthly income in dollars	450	605	320	344
Mean monthly illegal drug expenses in dollars	498	650	299	395
Childhood (to age 12) in low income community, in percent	28.9	27.5	49.1	35.5

NEITHER (*n* = 602) categories. Only 3.2 percent of the sample were classified as BARB + ALC and only 2.8 percent as BARB.

Substance Use Characteristics

The data on specific substance abuse divided on the basis of the sedative/alcohol use categories are summarized in table 5. The most frequent abusers of multiple substances were those subjects in the BARB and BARB + ALC groups. These two groups revealed the highest percentage of amphetamine, marijuana, cocaine, and minor tranquilizer abuse and the highest mean number of additional drugs. The presence of other substances being used regularly within the four categories must be carefully considered. It will allow for a more complete understanding of the four types, but further analyses of the types need also take into account the presence of possible contaminating or extraneous factors,

TABLE 2.—*Global demographic characteristics of NDACP subjects categorized on patterns of regular alcohol/sedative use on a lifetime basis*

Demographic characteristics	BARB + ALC	BARB	ALC	NEITHER
Age at admission, in mean years	28.5 (146)[1]	25.1 (75)	33.6 (778)	26.2 (490)
Female percentage	20.9 (148)	38 (79)	17.7 (791)	26.6 (500)
Mean age left school	17.0 (140)	17.7 (65)	16.7 (732)	16.8 (341)
Mean school years completed	10.9 (147)	11.5 (78)	10.10 (782)	10.07 (495)
Ethnicity, in percent:[2]				
Afro	23.1	9.1	40.1	22
Hispanic	17.5	26.0	21.2	30.8
Other	9.8	23.4	10.3	8.8
Anglo	49.7	41.6	28.4	38.5
Total percent	100.1 (143)[3]	100.1 (77)	100.0 (770)	100.1 (478)
Mean monthly income in dollars	432.83 (126)	583.99 (71)	317.13 (696)	310.33 (358)
Mean monthly illegal drug expenses in dollars	654.4 (131)	726.8 (73)	313.52 (724)	326.8 (445)
Childhood (to age 12) in low income community, in percent	40 (145)	26 (77)	50.3 (786)	34.5 (493)

[1] n's are given in parentheses.
[2] Percentages do not actually total 100 because of rounding.
[3] Row totals differ because of incomplete data.

TABLE 3.—*Personal and social characteristics of the NDACP subjects categorized on patterns of regular alcohol/sedative use for the 3 months prior to treatment*

Characteristics	BARB + ALC (*n* = 46)	BARB (*n* = 40)	ALC (*n* = 746)	NEITHER (*n* = 602)
Living with family members (percent)	67.5	60	53.9	62.9
Number of residences in last 12 months	2.92	2.56	1.17	1.24
Ever arrested for drug violations (percent)	45.6	40.0	27.9	38.4
Ever overdosed (percent)	54.3	53.8	35.7	35.0
Ever treated for emotional problems (percent)	55.6	52.5	28.5	25.9
Ever attempted suicide (percent)	27.3	35.0	18.5	15.9
Ever in auto accident while under the influence of drugs or alcohol (percent)	63.0	38.5	35.1	27.8
Ever incarcerated (percent)	60.9	55.0	59.2	43.2
Ever married (percent)	51.1	41.0	55.9	40.3
Ever had a full-time job (percent)	81.3	67.6	82.3	60.8

i.e., other drugs and their own specific correlates and consequences.

When all four groups are assessed for relative drug preference among the substance classes, it is obvious that heroin and especially marijuana were the two substances which showed high frequency of abuse across all four categories of abusers. It is, in fact, marijuana which was the most frequently abused drug within each category.

If the entire set of data is considered, a general impression emerges which suggests that there are distinctive differences between the *alcohol/sedative* users and others in the NDACP group. Perhaps it would be most instructive to consider both differences and similarities at this time in order to develop modal characteristics for each of the four groups. First, the heavy barbiturate user (BARB) and the sedative/alcohol abuser (BARB + ALC) ac-

TABLE 4.—*Personal and social characteristics of the NDACP subjects categorized on patterns of lifetime regular alcohol/sedative use*

Characteristics	BARB + ALC	BARB	ALC	NEITHER
Mean number of residences in last 12 months	2.66 (134)	1.72 (72)	1.62 (736)	1.11 (455)
Ever arrested for drug violations (percent)	87.8 (148)	69.6 (79)	76.0 (796)	63.7 (501)
Ever overdosed (percent)	61.0 (146)	63.3 (79)	33.4 (781)	30.1 (489)
Ever treated for emotional problems (percent)	47.9 (146)	48.7 (78)	26.9 (791)	23.7 (498)
Ever attempted suicide (percent)	33.3 (144)	32.1 (78)	16.0 (792)	14.7 (484)
Ever in auto accident while under the influence of drugs or alcohol (percent)	58.2 (146)	36.4 (77)	33.6 (782)	25.3 (483)
Ever incarcerated (percent)	71.6 (148)	46.8 (79)	57.8 (296)	39.1 (501)
Ever married (percent)	55.3 (143)	45.5 (77)	56.9 (779)	50.7 (495)
Ever had a full-time job (percent)	88.3 (111)	74.2 (66)	81.7 (573)	55.1 (405)

[1] Total *n*'s are given in parentheses.

TABLE 5.—*Percentage of NDACP subjects within each of the alcohol/sedative use categories who reported use of substances other than alcohol or barbiturate during the 3 months prior to admission*[1,2]

Drug	BARB + ALC (*n* = 46)	BARB (*n* = 40)	ALC (*n* = 746)	NEITHER (*n* = 602)
Heroin	23.9	42.5	15.8	19.1
Other opiates	10.9	22.5	2.9	3.2
Amphetamines	19.6	22.5	6.3	6.1
Marijuana	58.7	52.5	31.0	34.7
Hallucinogens	10.9	17.5	3.6	3.8
Cocaine	19.6	17.5	8.3	6.1
Minor tranquilizers	39.1	27.5	10.0	6.6
Inhalants	4.3	2.5	0.9	1.5
Nonprescription	2.2	0.0	0.8	1.3
Mean number of drugs used, not including alcohol and barbiturates	1.89	2.05	0.80	0.83

[1] The drug use category of others is not available for NDACP regular use 3 months prior to admission. Therefore, in comparison, for the mean figures for number of drugs used in this table, with comparable figures for PSU, a downward adjustment of 0.2 to 0.05 in the mean PSU figures should be made.

[2] Since response items are not mutually exclusive, column percentages cannot be summed.

count for less than 10 percent of the NDACP population, and therefore these are not significant abuse patterns in this sample. Those individuals who were significant abusers of alcohol (ALC) made up approximately half of the population surveyed in the NDACP study. (The multiple substance users, however, tended to fall into BARB and BARB + ALC groups.)

To highlight and briefly summate the findings, BARB and BARB + ALC were most heavily involved, and ALC and NEITHER were least heavily committed to a multiple substance use pattern. These groups divided similarly along socioeconomic lines with ALC and NEITHER having the lowest monthly incomes and having the highest percentages from low income communities. The four groups considered together indicated a shared preference for heroin and marijuana over other drug categories (excluding barbiturates or alcohol). Members of BARB and BARB + ALC, however, also were more likely to use minor tranquilizers, amphetamines, and cocaine. It is interesting that a higher percentage of the BARB + ALC group used marijuana and minor tranquilizers than did the other groups. It should be noted here that barbiturates, alcohol, and minor tranquilizers are classes of compounds with cross tolerance for each other, and that this triad of drug abuse has been described as a modal one for certain individuals. The BARB group was substantially more likely to use heroin and other opiates than were the other groups. Although the reasons for this pattern are not clear, it can be theorized that barbiturate use may be related to controlling a heroin habit or managing it when heroin is unavailable.

Racially, most groups contained at least 20 percent in the Afro category (except BARB, which was more than 94 percent Anglo), with the highest concentration of Afros in ALC. Hispanics were most frequent in BARB and least frequent in BARB + ALC, which was over 60 percent Anglo (their highest concentration); BARB had the lowest frequency of Anglos. Finally, the only gender differences occurred in ALC where females were the least frequent (17.4 percent) and BARB, where they constituted the highest percentage (27.5 percent).

Dividing the NDACP results on the basis of the categories of alcohol/sedative use thus provided some data which identify and characterize the individuals in each of the four groups. Especially significant was the finding that less than 10 percent of NDACP subjects reported BARB + ALC and BARB use patterns sufficient to be included in these use categories. It was anticipated that this type of drug abuse would be more prevalent and representative, even though a number of the centers collecting the NDACP data were oriented to the rehabilitation of heroin dependent persons. Nevertheless, it was encouraging that a series of related personal and social characteristics clustered with the four categories of alcohol/sedative use such that consistent pictures could be empirically constructed—not only for their descriptive values but also for possible use in treatment as well.

The second phase of the project compared the NDACP sample with the sample of polydrug users that were studied in San Diego. As will be seen, the methods used to examine the two studies were quite different. The NDACP study as reported here was primarily an inventory taken on a large subject sample, while the San Diego study focused upon a smaller subject sample, using a wide spectrum of assessment techniques.

THE SAN DIEGO POLYDRUG STUDY

Methodology

During 1973–75, the National Institute on Drug Abuse (NIDA) funded and sponsored a national, geographically diverse, collaborative research program focused upon multiple substance abuse. One of the 11 research centers established was located in San Diego. This program was designed to collect standardized, meaningful information on multiple substance abusers and to offer the most advanced treatment techniques to this patient population. While the program encouraged referrals for all types of polydrug users, the program did have a special interest in patients with a modal abuse pattern characterized by heavy use of central nervous system depressant drugs. Those individuals who were primary abusers of opiates and were opiate dependent on admission were referred elsewhere and were not included in the sample studied. All admissions to the San Diego Polydrug Study Unit (SDPSU) were by referral from other medical and treatment agencies. Specifically, the largest number of referrals (20 percent of the total) came from the county-operated 24-hour drug hotline. Other significant referral sources were as follows: inpatient psychiatric wards (5 to 10 percent), emergency rooms (5 to 10 percent), the San Diego Mental Health system (5 to 10 percent), community clinics (5 to 10 percent), private therapists (5 to 10 percent), the probation diversion program (5 to 10 percent), and other drug treatment programs (5 to 10 percent). Efforts to generate self-referred cases by public advertisement and media appearances proved to be relatively unrewarding.

During the 2½ years of SDPSU's operation, 170 patients were accepted for evaluation and treatment. Of these patients, 151 completed at least 1 aspect of the evaluation battery. The SDPSU initial intake form contained questions requesting detailed information on the patient's pattern of drug use during the 3-month period immediately preceding contact with the program. It is from this data base that patients were categorized into groups based upon their drug using patterns. A total of 122 patients provided sufficient information regarding both their alcohol and sedative use to classify them into the same four alcohol/sedative use categories used in the NDACP analysis. This group is the core subject sample which was used for the statistical analyses and data which follow.

The group evenly represented both males and females. Most subjects were in their twenties at the time of admission, with a handful being in their teens or over 35 years. Eight out of 10 were Anglo, with the remainder about evenly divided between Afro, Hispanic, and other categories. This ratio generally reflects that of the overall population of the San Diego SMSA. Half of the sample had never been married, while of those who had, only one in three reported marriages which were still intact. About half the subjects were high school graduates, five were college graduates, and three had never attended high school. The Hollingshead Index of Social Class for the subject's childhood family was obtained for two-thirds of the sample. The mean value which resulted, 4.5, is midway between the categories of skilled workers and sales/clerical personnel. In summary, the study sample was comprised mostly of young, unmarried, working class whites, representing both sexes, and having modest educational backgrounds.

Results

In order to assess the relationship between the use of alcohol and sedatives and the use of other drugs, the population was first divided into the four categories BARB + ALC, BARB, ALC, and NEITHER based on the criteria described earlier in the chapter. These criteria were applied to the 3-month period just prior to admission.

The results of this first level of analyses are reported in table 6, which compares subjects in the four alcohol/sedative use categories with respect to their regular (multiple weekly) use of other drugs, which is less stringent than the NDACP definition of regular use. The percentages of amphetamine, heroin, and marijuana use in the BARB + ALC group were significantly higher than in all other groups. There were also significant differences among the four groups regarding the regular use of other opiates, hallucinogens, cocaine, inhalants, and other drugs. It was only in the use of tranquilizers that the BARB + ALC group was comparable to the others.

TABLE 6.—*Percentage of SDPSU subjects categorized on patterns of alcohol/sedative use reporting multiple weekly use of substances other than alcohol or barbiturates during the 3 months prior to admission*

Drug	BARB + ALC ($n = 44$)	BARB ($n = 34$)	ALC ($n = 25$)	NEITHER ($n = 19$)	X^2 (p)[1]
Heroin	42.9	6.3	8.0	11.1	0.01
Other opiates	18.2	0.0	8.7	5.3	0.01
Amphetamines	68.3	30.3	25.0	0.0	0.01
Marijuana	79.1	55.9	62.5	38.9	0.01
Hallucinogens	25.0	12.5	12.5	5.9	0.01
Cocaine	14.3	5.8	4.2	10.6	0.01
Minor tranquilizers	35.0	35.3	36.0	35.3	n.s.[2]
Inhalants	13.9	6.0	8.0	5.3	0.01
Nonprescription	0.0	8.8	12.0	0.0	0.01
Other	25.6	15.6	8.0	5.3	0.01

[1] Each chi-square test was done with 4×2 tables, with regular use of substances being "yes" or "no."

[2] N.S. = Nonsignificant.

The BARB and the ALC groups were relatively indistinguishable from each other, although there were small differences with respect to amphetamines and marijuana. The NEITHER group differed notably from the BARB and ALC groups with respect to amphetamines, marijuana, hallucinogens, and cocaine.

In table 7 the drug use frequencies are recorded. Sixty-one percent of the BARB + ALC group indicated they were using at least three drugs regularly in addition to barbiturates and alcohol, which was considerably higher than any of the other three groups.

Based upon the data, the BARB + ALC group stands apart as representing the stereotype of the multisubstance abuser. On the other hand, those subjects who used alcohol or barbiturates, *but not both*, were less extreme in their drug abuse patterns; they tended to use two or three drugs concurrently, preferring marijuana and, to a lesser degree, minor tranquilizers and amphetamines. Those using neither alcohol nor sedatives on a regular basis tended to be primarily single substance abusers, involved with marijuana (38.9 percent) and minor tranquilizers (35.3 percent) and with some heroin use (11.1 percent).

Psychological Data

It has been mentioned earlier that in addition to gathering data on drug use history, a wide variety of demographic, medical, psychiatric, and psychometric data were collected on the subjects at intake and at followup. The instruments and measures used are presented, along with a brief discussion of the findings for the four groups.

Intake form
Medical history and physical examination
Psychiatric diagnostic interview
Halstead-Reitan Neuropsychological Battery
Psychiatric Evaluation Form (PEF)
Global Assessment Scale (GAS)
Electroencephalogram
Minnesota Multiphasic Personality Inventory (MMPI)

TABLE 7.—*Comparison of total number of drugs used regularly by SDPSU subjects characterized on patterns of alcohol/sedative use*

Additional drugs used (multiple weekly)	BARB + ALC ($n = 44$)	BARB ($n = 34$)	ALC ($n = 25$)	NEITHER ($n = 19$)
0 (percent)	2	9	12	21
1 (percent)	16	50	32	58
2 (percent)	21	15	32	11
3 or more (percent)	61	27	24	10
	100	101[1]	100	100
Mean	3.06	1.76	1.80	

[1] Percentages do not actually total 100 because of rounding.

California Psychological Inventory (CPI)
Zungs Self Rating Depression Scale
Profile of Mood State (POMS)
Drug use history questionnaire
Wechsler Adult Intelligence Scale

Both the drug use history questionnaire and the intake form contained numerous inquiries regarding the drug and nondrug related aspects of the subjects' life histories. A number of items were found to relate to the four alcohol-sedative use patterns and some of these variables, associated with social functioning and drug use patterns, are summarized in table 8.

In addition to the biographical and clinical inventories, the subjects were administered two psychometric personality tests—the California Psychological Inventory (CPI) and the Minnesota Multiphasic Personality Inventory (MMPI)—along with the Zungs Self Rating Depression Scale and the Profile of Mood States (POMS). In addition, the primary therapist for each patient evaluated the patient's clinical status and general level of personal functioning and coping using two standardized instruments: the Global Assessment Scale (GAS) and the Psychiatric Evaluation Form (PEF). The data from these inventories were analyzed with the sample divided on the basis of the alcohol/sedative use categories, and no differences were found on the following instruments: the California Psychological Inventory, Minnesota Multiphasic Personality Inventory, Zungs Self Rating Depression Scale, Profile of Mood States, and the Global Assessment Scale. It was only in the PEF that differences between the four groups were obtained: These are summarized in table 9. Comparison of means by a series of tests indicates that the BARB + ALC group members were rated by their therapists as being significantly higher users of narcotics than the members of other groups which, in turn, were not significantly different from

TABLE 8.—*Personal and social characteristics of the SDPSU subjects categorized on patterns of alcohol/sedative use, in percent*

Characteristics	BARB + ALC (*n* = 44)	BARB (*n* = 34)	ALC (*n* = 25)	NEITHER (*n* = 19)	*n* (*n* = 122)	p (χ^2)
Percentage female	44.2	70.0	28.0	57.9	121	0.009
Living with 1 or more family members	48.8	63.6	32.0	78.9	120	0.01
Resided in current location 9 months or more	30.0	43.8	28.6	68.4	116	0.02
First source of barbiturates: friends	76.5	26.1	64.7	33.3	85	0.02
Arrests for drug violations	87.5	45.5	70.6	50.0	85	0.02
Monthly illegal drug expenses greater than $20	59.4	29.2	18.8	25.0	84	0.016
Most drugs obtained from friends or family	66.7	42.1	36.8	23.1	81	0.035
Initial drug trials predominantly due to curiosity or boredom	68.6	36.0	35.0	26.7	95	0.01
Multiple romantic attachments	70.6	42.1	37.5	33.3	81	0.04

Note: Chi-square tests were done with 4 × 2 tables; personal and social characteristics variables were dichotomized by the authors where cutoff point was not inherent in the categories.

TABLE 9.—*Differences on assessment scales oriented toward psychopathologies among subjects categorized by patterns of alcohol/sedative use*

Scale[1]	BARB + ALC (*n* = 44)	BARB (*n* = 34)	ALC (*n* = 25)	NEITHER (*n* = 19)	F Ratio	*p*<
Psychiatric evaluation form:						
Narcotics/drugs	4.35	3.81	3.84	4.00	2.689	0.05
Alcohol abuse	2.64	1.91	2.96	2.18	3.657	0.02
Suicide/self-mutilation	2.29	1.41	1.68	1.94	3.650	0.02
Antisocial attitudes/acts	3.21	2.59	2.68	2.30	3.500	0.02
Depression	3.10	3.09	2.68	3.71	3.075	0.03

[1] The PEF scales are rated as follows: 6 = extreme, 5 = severe, 4 = moderate, 3 = mild, 2 = minimum, 1 = none.

each other. The therapist estimates of severity of alcohol abuse were consistent with the alcohol/sedative use classifications for the subjects in the BARB + ALC and ALC groups.

The "suicide self mutilation" and "antisocial attitudes acts" scales on the PEF measured both self-directed and other-directed hostile and aggressive behavior. Here the BARB + ALC group had the highest rated scores. Thus, there is evidence that the BARB + ALC group was judged to be a higher suicidal risk and also a higher risk for impulsivity and acts of violence. This confirms a street "myth" which indicates that the substance abuser who regularly combines alcohol and barbiturate use is behaviorally one of the most unpredictable of the various types of drug users. Interestingly, the group judged by a clinical PEF (psychological evaluation form) to be the most depressed was the group that did not regularly abuse alcohol and/or barbiturates (i.e., the NEITHER group). This may be simply because this group of individuals was genuinely more depressed, or it may be that they were less sophisticated in their self-medicating attempts—not regularly using substances known to temporarily alleviate depressed moods. The clinicians' ratings of overall impairment, based on the Global Assessment Scale scores, were strikingly low. On this particular scale, the lower the score the greater the individual's impairment is judged to be. All group scores fell in the 20 to 30 range, which indicates that basically the patients were seen as being unable to function with even a modicum of effectiveness in most areas of their lives. They were also seen to manifest seriously flawed judgment and were unable to communicate effectively with others in their environment.

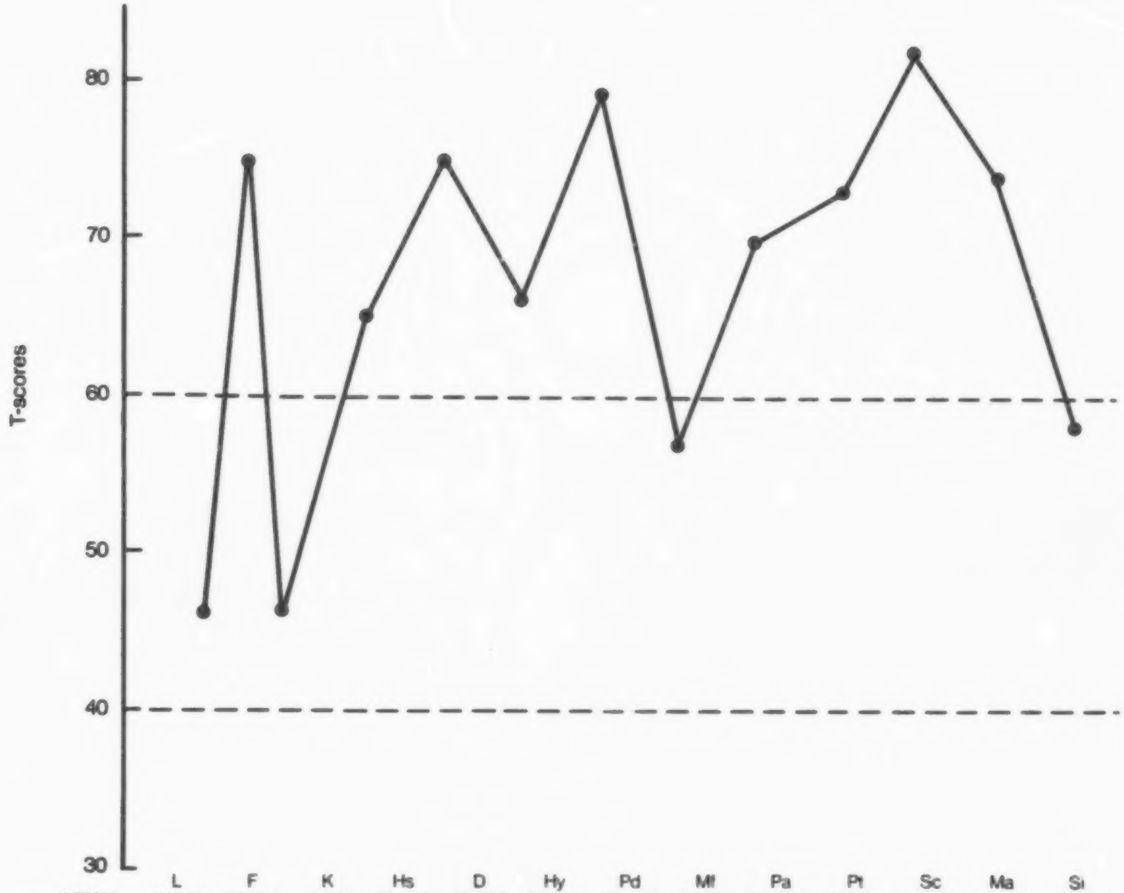
Thus, the entire population studied by the SDPSU was judged by experienced clinicians to be markedly dysfunctional both personally and socially. It is particularly interesting that the single most dysfunctional group was the one combining heavy alcohol and sedative use (i.e., the BARB + ALC group). These subjects appeared to be more impaired in their ability to function effectively on a day-to-day basis and to manage their lives in an acceptable manner. Since this type of substance abuser proved to be significantly more dysfunctional than the others, it may be that the BARB + ALC group is the one most at risk for psychiatric disorder and most in need of traditional forms of psychiatric intervention. This, in part, is supported by NDACP data which also indicated that the BARB + ALC pattern of substance abuse and the highest correlation with psychological instability. (See tables 3 and 4.) It was interesting that the heavy alcohol/sedative abuser could be singled out from others as being more impulsive, having poorly modulated affect and mood, and—while not grossly psychotic—manifesting major incapacities in daily living and coping abilities.

Analysis of MMPI, CPI, and POMS results

When the data from the MMPI, CPI, and POMS were compared on the basis of the alcohol/sedative use categories, no consistent differences emerged. However, the SDPSU subject sample taken as a totality did present some interesting findings. In figure 1 the composite MMPI profile for the entire group is presented. As can be seen, all but two scales—masculinity/femininity (Mf) and social introversion (Si)—fell between 1½ to more than 3 standard deviations above the norm, while the MP and SI scales were a full standard deviation above the norm. Thus, the mean MMPI profile for these individuals was markedly elevated, indicating a high degree of psychopathology as measured by this inventory. A similar profile, with major peaks on the psychopathic deviate (Pd), schizophrenia (Sc), and depression (D), scales constitutes an eight, four, two pattern which has been previously found in young delinquents and incarcerated persons. Specifically, individuals with this MMPI configuration are generally impulsive and nonconformist, and tend to reject traditional lifestyles. Further, there is often a high incidence of character disorder and borderline states in patient populations with peaks on these particular scales on the MMPI.

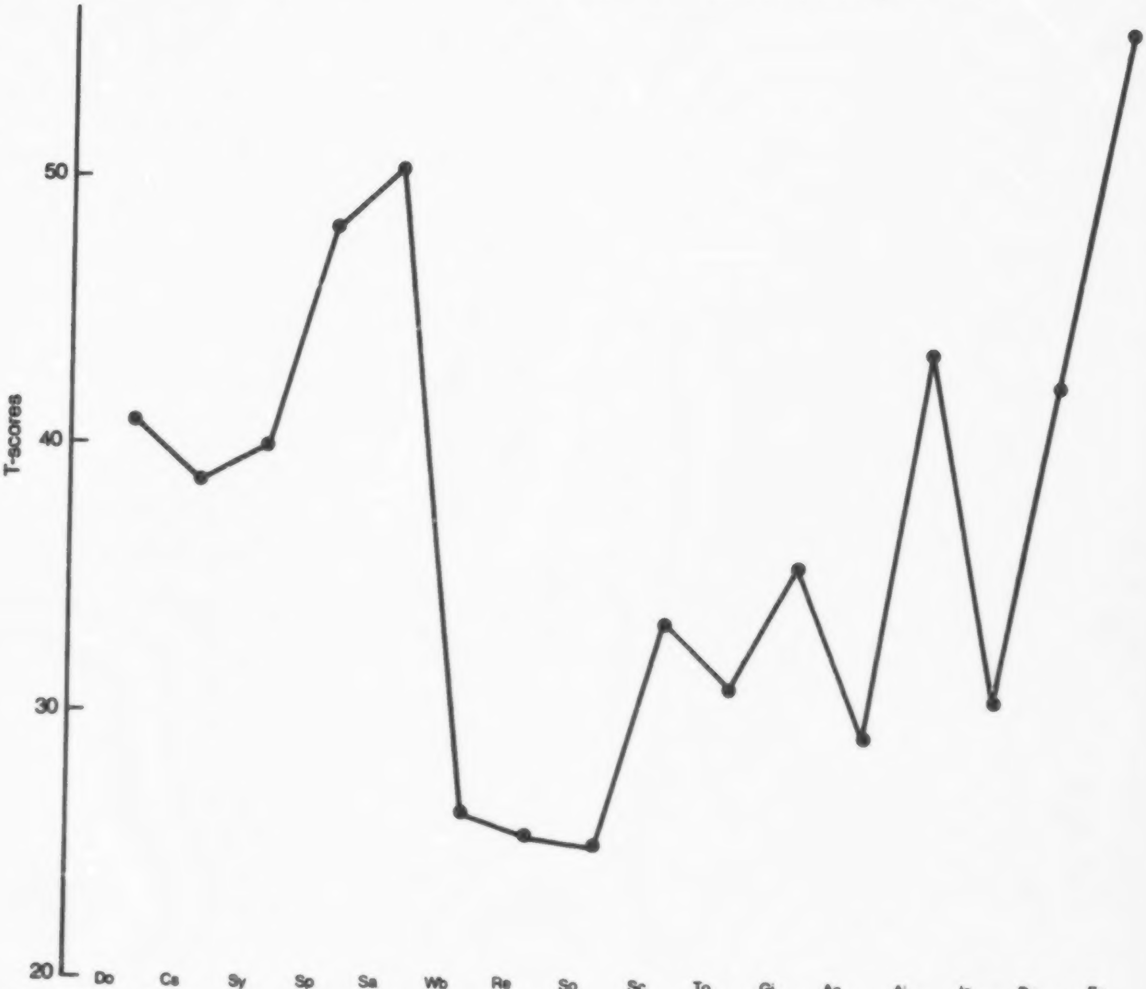
Unlike the MMPI, the California Psychological Inventory (CPI) is not focused on issues of psychopathology but is oriented to assessing the usual coping skills and traits that are necessary for successful living in this society. The composite mean profile for the SDPSU subject sample is graphically presented in figure 2. Unlike the MMPI, in which high scores mean increased deviance, lower scores on the CPI indicate less achievement in those behaviors assessed by each scale. On the three scales which reflect one's capacity for autonomy, independent thought and actions (i.e., Ai, Cs, and Py), subjects scored either at the mean or one standard deviation below the mean. As was anticipated, scores on those seven scales which reflect the capacity for internal controls and general self-adjustment (i.e., Wb, Re, So, Sc, To, Gi, and Ac) were two standard deviations below the standardized mean. In addition, the subjects indicated a self-perceived reduction in cognitive efficiency by a

FIGURE 1.—Minnesota Multiphasic Personality Inventory (MMPI) for polydrug sample (n=122)



	L	F	K	Hs	D	Hy	Pd	Mf	Pa	Pt	Sc	Ma	Si
MEAN	46.287	75.194	46.500	65.167	75.287	66.778	79.843	57.491	70.685	73.435	82.491	74.620	58.778
S.D.	5.989	14.602	7.566	13.697	15.336	11.401	11.308	11.965	12.943	14.094	17.224	10.699	11.225
RANGE	36-63	48-118	33-66	39-106	44-123	42-100	40-104	24-86	44-107	38-114	47-128	50-99	34-82
	Lie	Validity	Correction	Hypochondriasis	Depression	Conversion Hysteria	Psychopathic Deviate	Masculinity/femininity	Paranoia	Psychasthenia	Schizophrenia	Hypomania	Social Introversion

FIGURE 2.—California Psychological Inventory (CPI) profile for polydrug sample (n=122)



	Do	Cs	Sy	Sp	Sa	Wb	Re	So	Sc	To	Gi	Ac	Ai	Ie	Py	Fx
MEAN	41.029	38.777	40.301	48.874	50.311	26.204	25.437	24.846	33.631	31.117	35.650	28.971	43.845	30.726	43.039	55.641
S.D.	12.711	10.669	11.778	11.497	10.717	17.088	11.178	10.515	10.034	11.227	8.986	12.506	10.162	13.159	9.904	10.946
RANGE	15-68	14-62	17-70	25-76	25-74	14-63	0-58	5-52	13-58	10-61	20-60	5-60	13-65	-3-64	21-68	30-76
	Dominance	Capacity for status	Sociability	Social presence	Self-acceptance	Sense of well being	Responsibility	Socialization	Self-control	Tolerance	Good impression	Achievement via conformance	Achievement via independence	Intellectual efficiency	Psychological mindedness	Flexibility

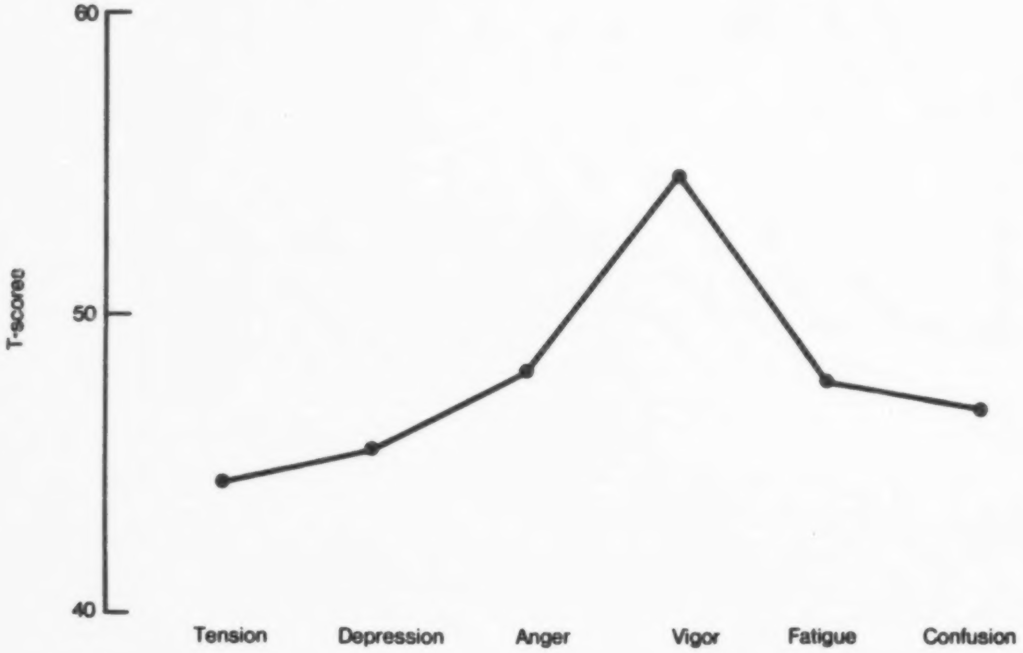
mean rating on the intellectual efficiency scale (Ie) of two standards deviations beneath the average level. Again, the CPI profile is consonant with those found in unselected subject samples of male and female delinquents (Dinitz et al. 1958; Rudoff 1959.)

It can be hypothesized that the inability of these personality inventories to differentiate between the four alcohol/sedative use groups is due to the fact that the general scores are so deviant for the entire sample that it is not possible for one group to stand out as being significantly more deviant than the others. Further, there is the possibility that, in contrasting the SDPSU data with the results of personality inventories from other studies, research may present a general pattern of social deviancy in which severe drug abuse is but one deviant behavior occurring within a cluster of other deviant characteristics.

In summary, the results from these two personality inventories, each oriented to different aspects of normal and abnormal personality function, suggest that the SDPSU sample resembled certain groups of delinquent populations not characterized by tendencies toward drug abuse.

Data for the Profile of Mood States (POMS) for the entire subject sample are presented in figure 3; it is quite apparent that there is nothing remarkable in these results. All scales except vigor fell just below the norm and were virtually indistinguishable from those data which would be obtained from a group of normal subjects. These results are somewhat inconsistent with data from the other inventories, but this mood scale is not oriented to pathological extremes in mood or affect and therefore it is not surprising that abnormalities of this type might not be identified.

FIGURE 3.—Profile of Mood States (POMS) for polydrug sample (n=122)



	Tension	Depression	Anger	Vigor	Fatigue	Confusion
MEAN	44.4	45.4	48.0	54.7	47.9	46.9
S.D.	10.8	10.5	11.7	11.9	10.2	9.9
RANGE	29-69	32-73	37-80	33-86	34-72	30-70

Analysis of EEG, Halstead-Reitan, and WAIS test results

Another aspect of the intake battery included both a conventional EEG, scored using the Mayo system, and the complete Halstead-Reitan Neurophysiological Battery. These assessment procedures were administered to 97 of the 122 SDPSU subjects. It has been reported in previous publications (Judd and Grant 1975; Grant and Judd 1976; Judd et al. 1978a) that approximately half of the SDPSU subject sample were found to have abnormalities on either the EEG or the Halstead-Reitan or both. There were no differences found when the subject sample was divided into the four alcohol/sedative use categories and contrasted. That is, none of the use categories stood apart as being more impaired or abnormal on these tests than any other group.

In contrast to the above, differences were recorded on several aspects of the Wechsler Adult Intelligence Scales (WAIS) and on two subtests of the Aphasia Screening Battery. The WAIS is comprised of six verbal and five performance subtests, which are scored for verbal performance and overall IQ. As can be seen in table 10, the group which did not heavily abuse alcohol or barbiturates (i.e., NEITHER) showed significantly less impairment than the other three groups. A Sheffe test of means determined the BARB + ALC and BARB groups to be scoring significantly lower than the other two groups on the verbal and full scale IQ. These results are paralleled by two aphasia screening subtests: spelling dyspraxia (poor spelling capacity) and dyscalculia (poor mathematical ability). It is very interesting that the lower intellectual functioning as measured by these procedures appears to be related to heavy barbiturate abuse, since barbiturates are the one class of drugs consistent in each of these two groups of alcohol/sedative users (BARB + ALC and BARB). This is not surprising, since these compounds when used chronically to exert a consistent CNS depressant effect upon those higher cortical functions tapped by these assessment procedures. Further, the fact that the Impairment Index and Clinical Rating on the Halstead-Reitan did not differentiate between the groups would indicate a more diffuse, generalized, and subtle cognitive impairment, which is completely consistent with the chronic barbiturate effect.

Summary

In summary, the subject sample studied at the SDPSU as a group proved to be socially and personally dysfunctional, manifested a significant amount of psychopathology, and evidenced a notable degree of cognitive impairment as well. When the SDPSU sample was contrasted on the basis of the four categories of alcohol/sedative use (BARB + ALC, BARB, ALC, and NEITHER) a number of significant differences emerged. The differences were cohesive enough to point to a series of characteristics which were specific to each of the four groups of subjects.

It is the BARB + ALC group which appears to differ most clearly from the rest. Subjects in this category had a pattern of abuse which included the use of more different types of drugs and in larger amounts than any other group. Of these additional substances consumed by BARB + ALC subjects,

TABLE 10.—*Comparison of performances on the Wechsler Adult Intelligence Scale and Halstead Reitan Battery by SDPSU subjects categorized on patterns of alcohol/sedative use*

Test	BARB + ALC ($n = 44$)	BARB ($n = 34$)	ALC ($n = 25$)	NEITHER ($n = 19$)	χ^2	p
WAIS verbal I.Q. (mean)	104.6	99.7	111.2	111.9	5.600	0.001
WAIS performance (mean)	99.7	98.7	102.7	109.1	2.863	0.040
WAIS full scale I.Q. (mean)	101.4	99.2	108.2	111.6	5.273	0.002
Spelling dyspraxia (percent impaired)	40.0	40.0	20.0	0	7.629	0.050
Dyscalculia (percent impaired)	47.1	35.3	11.8	5.9	10.790	0.010

Note: χ^2 was computed by 4×2 tables with dichotomies determined for the WAIS scores.

minor tranquilizers, heroin, and amphetamines were the most popular. These subjects were much more heavily affiliated with their drug-using peers, had higher levels of drug expenditures, and more frequent drug arrests. Their therapists rated them as the most drug involved, the most self-destructive, and distinctly antisocial. In short, they appear to be heavily identified with and committed to the drug-abusing lifestyle. It is of particular interest that there is some evidence indicating that subjects in the BARB + ALC group may be psychiatrically the most disturbed, have the highest level of cerebral dysfunction, and manifest the greatest disparity between their current low levels of function and previous premorbid levels of adjustment and achievement.

While the other groups present profiles which are less distinct than that of the BARB + ALC group, they still reveal discernible patterns. The BARB group was primarily female, the least likely to have initiated barbiturate use with peers, and the least likely to have been arrested on drug-related charges. In addition to using barbiturates, these subjects used marijuana, minor tranquilizers, and amphetamines most frequently. The BARB subjects showed signs of depressed cognitive function as measured on parts of the WAIS and of psychopathology as well, but these traits were less marked than they were in the BARB + ALC group.

The ALC group was comprised mainly of transient males, with fewer family or school ties, and with frequent contact with the police. Unlike BARB + ALC, the ALC subjects showed few indications of cognitive deficit and appeared to be relatively more stable psychologically. Overall, these people used fewer drugs than the BARB + ALC or BARB groups and indulged most frequently in marijuana and minor tranquilizer use in addition to alcohol.

Comparatively speaking, the NEITHER group appeared to be the most stable in terms of residence and family ties. They used fewer drugs than any other group, often abusing only a single substance or class of substance. Approximately one-third of this group regularly abused only minor tranquilizers, and 20 percent of the group were regular users of marijuana alone. Their therapists considered them the least deviant and antisocial and the most depressed. The subjects themselves reported the lowest frequency of romantic attachments. Whereas the BARB + ALC group appeared to be the most obviously deviant and troublesome to society, the NEITHER group was more quietly detached and passive by nature.

CONCLUSIONS

It is both interesting and informative to consider the NDACP national study and the SDPSU study apart from one another, but much would be lost if both data sets were not perused for commonalities. In this section of the chapter, then, the data from these two projects will be discussed, sifted, and reassembled to compare and contrast the salient characteristics of these polydrug users.

Before similarities can be commented upon, the more obvious differences in the samples and methods of the two studies must be mentioned, since these affect the interpretation when the data are combined. One of the first differences between studies is the pattern of referrals. A significantly large portion of NDACP admissions were referred by court action (22 percent), by family and friends (18 percent), or were self-referred (13 percent); in contrast, these categories together totaled only 15 percent in the SDPSU. Significant NDACP numbers (ranging from 5 to 10 percent for each referral source) also came from other drug programs, from hospitals, and from alcohol programs; very few (1 percent) came from hotlines or crisis centers, although this source provided 25 percent of SDPSU's total referrals. SDPSU tended to depend upon a more specialized referral policy based on a full range of contacts with all types of treatment agencies in the community, while NDACP took patients from ongoing drug rehabilitation programs.

There are a number of significant demographic differences between the NDACP sample and the SDPSU sample. The NDACP sample was largely male (80 percent), was on the average 4 years older (30 years), and was much more diverse in ethnic background. There were also smaller differences between the samples in marital status (with more broken marriages in NDACP), education (with NDACP showing less time spent in school), and socioeconomic origins (with NDACP subjects tending to come from lower income communities).

Some of the observed differences can be ascribed largely to the Standard Metropolitan Statistical Area (SMSA) and regional demographic variations—e.g., the ethnic distribution of San Diego versus that of the urban Northeast, where a large number of NDACP clients were located. It does appear that the following factors may account for the differences between the subject samples of the two studies: differences in referral sources; different admission protocols; different research strategies and goals; and finally, SDPSU's special interest in the nonopiate CNS depressant abuser.

The important differences come into sharper focus when the alcohol/sedative use patterns of the two samples are compared. There is an order-of-magnitude difference between the percentages of subjects regularly using barbiturates (BARB + ALC and BARB) in the two samples. Sixty-four percent of the SDPSU group were regular barbiturate users versus approximately 6 percent in the NDACP study. The broad, carefully cultivated referral network at SDPSU was perhaps more efficient in identifying and passing on higher numbers of barbiturate abusers, and this specialization artificially inflated the numbers of this type of abuser; the NDACP figure may therefore more realistically reflect the proportionate numbers of individuals entering treatment with this particular abuse pattern. It is interesting to note that the select group referred to SDPSU has virtually the same proportion of regular alcohol users (ALC and BARB + ALC) as the NDACP group; that is, about 55 percent could easily be categorized as significant and regular alcohol users in spite of the fact that alcoholics per se were often referred out of the SDPSU.

In the NDACP sample the BARB group exceeded all others in the use of heroin and of other opiates, while in the SDPSU sample (see table 6) the BARB + ALC group was the highest user of heroin (BARB + ALC, 42.9 percent versus 10 percent for all other groups).

The contrast is highlighted by the figures for mean number of additional drugs used (see tables 5 and 6). If alcohol and barbiturates, which define the drug types themselves, are not counted, the means for the number of additional drugs used are about 2:2:1:1 for NDACP and 3:2:2:0 for SDPSU. Thus, in the NDACP sample, the regular use of barbiturates correlates with a diversity of other drug use as well, but regular alcohol use does not. In the SDPSU sample, both alcohol and barbiturate use correspond to wider use of other drugs, but it is the "alcohol plus barbiturate user" who demonstrates the greatest diversity. The definitional difference of "regular" usage in both samples must also be reiterated. In the NDACP sample, regular use was defined as daily use for 1 month. In the SDPSU sample, regular use was defined as multiple weekly use. Drug diversity appears to be the most important and salient difference between the two studies and their subsamples. Since findings from the two studies are generally in agreement with each other, user group characteristics common to both can be used to form meaningful modal profiles. Table 11 presents various profiles of NDACP and SDPSU clients based on patterns of alcohol/sedative use.

In summary, if the results from both the NDACP and SDPSU studies are considered for overall impressions, several points emerge. First, it is obvious that persons classified as preferring to use barbiturates, either alone or in conjunction with alcohol, constitute only about 10 percent of the national multisubstance-using population (as represented by NDACP). However, their limited numbers do not prohibit the creation of cohesive and consistent profiles for four categories of alcohol/sedative use. If the four groups are placed on a continuum of severity of disturbance, the alcohol/barbiturate group can be seen as the most extreme, followed by the groups preferring barbiturates alone, alcohol alone, and neither (see table 11).

In terms of future therapeutic procedures, however, it appears that these groups might best be viewed according to the degree of psychopathology, cognitive dysfunction, and social maladaption. Generally, subjects in BARB + ALC and BARB present a different picture from those in ALC and NEITHER. While the two former groups displayed a potentially volatile combination of pronounced psychopathology, reduced cognitive abilities and deep involvement in the drug/alcohol abuse subculture, the two latter groups were far less involved with substance-abusing peers, showed no signs of cognitive deficit on tests employed, and were judged as less abnormal psychologically.

Therapeutic intervention of some kind is undoubtedly warranted for polydrug abusers in all four categories, and may be particularly critical for the BARB + ALC subjects because of their pronounced psychopathology. However, because the BARB + ALC and BARB groups did demonstrate cognitive impairment, they may not be suited for certain psychotherapy techniques such as transactional analysis, complex behavioral contracting, verbal encounter groups, or psychodynamic therapy which require sophisticated verbal and problem solving skills. Patients experiencing difficulties comprehending or responding to the complex verbal and abstracting demands of these psychotherapeutic approaches may become confused or suffer increased anxiety or depression. Imposing any stress upon persons already laboring under a variety of psychological and/or physiological pres-

TABLE 11.—*Profile of subjects from pooled NDACP and SDPSU studies categorized on patterns of alcohol/sedative use*

Categories of subjects based on alcohol/barbiturate abuse	Social/drug behavior	Intellectual performance	Psychological profile	Demographic information	Criminal profile
BARB + ALC (Regular abuse of both barbiturates and alcohol[1])	Close ties to family Close ties to drug-using peers Moderate frequency of romantic attachments and marriage Very high multiple-substance abuse rate	Cognitive impairment on WAIS subtests and Aphasia Screening Battery	Highest clinical rating of psychopathology, especially of aggression and hostility High suicide attempt rate High overdose rate High frequency of treatment for emotional illness	Relatively more education than other groups Relatively better paid than other groups Origins tend to be from middle to lower middle class neighborhoods	Frequent arrests and incarceration on drug-related charges
BARB (Regular abuse of barbiturates but not of alcohol)	Close ties to family Close ties to drug-using peers Low frequency of romantic attachments and marriage	Cognitive impairment on WAIS subtests and Aphasia Screening Battery	Moderately high psychological dysfunction High suicide attempt rate High overdose rate High frequency of treatment for emotional illness	Relatively more education than other groups Relatively better paid than other groups Origins tend to be from middle to lower middle class neighborhoods Highest percentage of women in any group	High arrests and incarceration on drug-related charges
ALC (Regular abuse of alcohol but not of barbiturate)	Weak ties to family Weak ties to drug-using peers Moderate frequency of romantic attachments and marriage, but tend to live alone Moderate multiple-substance abuse rate	Normal functioning on tests administered	Moderate psychological dysfunction Low suicide attempt rate Low overdose rate Low frequency of treatment for emotional illness	Relatively less education than other groups Relatively less well paid than other groups Origins tend to be from lower middle to lower class neighborhoods	Modest arrests and incarceration on drug-related charges
NEITHER (Regular abuse of neither barbiturates nor alcohol)	Close ties to family Weak ties to drug-using peers Low frequency of romantic attachments and marriage Low multiple-substance abuse rate	Normal functioning on tests administered	Moderate psychological dysfunction Low suicide attempt rate Low overdose rate Low frequency of treatment for emotional illness	Relatively less education than other groups Relatively less well paid than other groups Origins tend to be from lower middle to lower class neighborhoods	Low arrest and incarceration on drug-related charges

---

[1] Regular substance use definition differed in the NDACP and SDPSU samples and has been noted earlier.

sures could precipitate further maladaptive coping behavior and would probably exacerbate existing cognitive disorganization.

It is suggested, therefore, that multisubstance abusing patients who demonstrate cognitive deficits should be considered for placement in treatment programs which rely on highly structured therapy emphasizing limited goals in precise, straightforward language. Treatment sessions, which should be held frequently, would be most effective if presented in a brief, supportive, and explanatory manner rather than using a prolonged, confrontational and abstract approach. Patients could thereby avoid the possible negative repercussions which would be introduced through the imposition of unrealistic response requirements.

Subjects in the ALC and NEITHER groups present quite a different picture. They were judged by clinical raters to be less unstable psychologically than the people who abused barbiturates (with or without alcohol). In addition, they showed no signs of cognitive deficiency either on the WAIS or on the Aphasia Screening Battery, and their ties to the drug/alcohol abusing subculture appeared to be limited (in contrast to the strong involvement of the BARB + ALC and BARB subjects). Their social lives outside of this milieu are, however, unusually isolated.

The ALC group, despite a moderately high rate of marriage, had the lowest frequency of living with relatives—suggesting that marital relationships which had been contracted were not very successful. Interestingly enough, ALC group members reported only infrequent multiple romantic attachments. In all, these people prefer to live alone, avoiding long-term romantic or emotional commitments. The NEITHER subjects are somewhat different in that they have a high frequency of living at home or with relatives. However, they report the lowest rate of marriage and a low frequency of multiple romantic attachments. Thus, while these subjects do seem to need some social support or interaction, they limit contact almost exclusively to members of their family group.

The obvious social isolation of both ALC and NEITHER subjects from their drug culture peers and from members of the opposite sex suggests substantive impairment in their ability to develop and/or continue intimate interpersonal relationships. This behavioral aspect suggests that, in terms of treatment, these subjects might be quite amenable to social rehabilitation techniques in addition to other psychotherapeutic measures that are dictated by their clinical condition. This group of polydrug users thus may derive the greatest benefits from group therapy techniques—specifically those that focus on the development of interpersonal social skills.

As a final note the authors recommend that, since persons in all four categories of multisubstance abusers might require special treatment, certain procedures at patient intake might help clinicians identify individuals for whom such treatment is warranted. While lengthy, indepth testing is not feasible when the patient first appears, it is advisable to provide for a thorough physical examination, with emphasis on detecting signs of addiction and/or withdrawal; a full neurological examination, with emphasis on the cognitive aspects of mental status; and the completion of a thorough substance abuse history by the subject emphasizing both recent and lifetime consumption patterns. Subjects displaying gross signs of cognitive impairment, drug or alcohol dependence, and/or heavy multiple substance abuse would then be selected for further testing and possible placement in special treatment programs in addition to or in lieu of the usual therapy techniques. Such an approach is the most efficient way to rapidly identify and treat the types of abusers described in this chapter and is particularly apt when treatment resources are limited. Such resources would be more appropriately applied to the drug-using subgroups demonstrating cognitive impairment, heavy substance abuse, and pronounced psychiatric instability—since it is these people who pose the most immediate danger to themselves and to society in general.

REFERENCES

Dinitz, S.; Kay, B.; and Reckless, W. C. A self-gradient among potential delinquents. *Police Science,* 49:230-233, 1958.

Grant, I., and Judd, L. L. Neuropsychological and EEG disturbances in polydrug users. *American Journal of Psychiatry,* 133(9):1039-1042, 1976.

Judd, L. L., and Grant, I. Brain dysfunction in chronic sedative users. *Journal of Psychedelic Drugs,* 7(2):143-149, 1975.

Judd, L. L.; Grant, I.; Bickford, R.; and Lee, W., et al. Comparison of results from serially collected neuropsychological and EEG data in a group of polydrug abusers. In: Adams, K., et al., eds. *Polydrug Abuse: Results of a National Collaborative Study.* New York: Academic Press, 1978a.

Judd, L. L., Attewell, P.A., Riney, W.B., Avery, R.F. The response of traditional health care agencies to non opiate abusers. In: Adams, K., et al., eds. *Polydrug Abuse: Results of a National Collaborative Study.* New York: Academic Press, 1978b.

Rudoff, A. *The PICO Project: A Measurement of Casework in Corrections. Second Technical Report of Preliminary Findings.* Tracy, Calif.: Deuel Vocational Institution, 1959.

BLANK PAGE

Chapter 5
Crime and Alternative Patterns of Substance Abuse

James A. Inciardi, Ph.D.
Division of Criminal Justice
University of Delaware

INTRODUCTION

> . . . No single law enforcement problem has occupied more time, effort and money in the past four years than that of drug abuse and drug addiction. We have regarded drugs as "Public enemy number one," destroying the most precious resource we have—our young people—and breeding lawlessness, violence and death.
>
> *Richard Nixon*
> The White House
> March 14, 1973

When President Richard Nixon offered these comments a half decade ago, he was clearly reflecting the national frustrations concerning the social casualty of drug abuse. But in addition, in choosing to identify the drug problem as the Nation's "public enemy number one" and as a phenomenon breeding "lawlessness, violence and death," he was also solidifying the notion of a strong relationship between crime and drug abuse. To the residents of the Nation's inner cities and congested suburbs who were already the victims of crime or who lived constantly in the fear of such activity, Nixon was suggesting that "crime in the streets" and drug abuse were primarily one and the same issue; he was echoing the posture of the National Alliance on Safer Cities which had already designated drug abuse as the No. 1 cause of street crime; and he was seemingly offering the idea that if the drug problem were controlled, crime in the streets would necessarily and significantly diminish. Then too, the President was furthering the tradition of the "criminal model of drug abuse," a conception of the drug problem that has now endured for almost a century, and one which has maintained that drug abuse and crime are unconditionally related, that drug abuse rests at the foundation of the largest segment of urban crime, and that the drug abuser is logically and necessarily a criminal.

Clearly, crime and drugs are in many ways related, but the relationship between the two phenomena has never been fully understood, despite the many pronouncements to the contrary. Is criminal behavior, first of all, antecedent to drug abuse and addiction, or does a career in crime emerge subsequent to the onset of drug taking? Stated differently, is crime the result of or response to a special set of circumstances brought about by the use of drugs; alternatively, is drug abuse simply a form of the antisocial behavior already manifested by criminal segments of the population? Questions such as these assume an absolute link between drug abuse and crime and have instigated an even longer list of inquiries: For example, does the onset of drug abuse bring about a change in the intensity of criminal behavior? Does criminal involvement increase or decrease subsequent to addiction or abuse? What kinds of crimes do drug takers engage in—are they aggressive or profit oriented? More importantly, are drugs and crime related at all, and if so, how? Perhaps crime is a result of drug use, but only within certain populations. And too, both drug use *and* crime may indeed have a relationship, but only indirectly; perhaps there is an interrelated third factor or set of factors.

Within the context of these inquiries and issues, this chapter intends to further examine the phenomenon of the interrelationship of crime and drugs—and to do so within historical development of attitudes concerning this interrelationship. Following this section, a presentation of theoretical (research) perspectives will attempt to justify and introduce the empirical studies which form the core of this paper. More specifically, a range of data sets are presented which argue that while crime and drugs are indeed related, the specific nature of the relationship can only be determined relative to alternative populations of substance abusers. That is, the nature and extent of criminal involvement may necessarily vary from one type of drug-using group to another, and as such, any study of these phenomena must account for such variance.

In an attempt to demonstrate the general differences among drug-using groups, two cohorts of drug abusers—an emergency room sample (from two emergency rooms) and a treatment sample (from 10 treatment sites) —are examined. Within these samples, subgroups are isolated in terms of the primary drug of abuse to further examine the premise that there is no single monolithic kind of "drug abuser," and that their general levels of criminal involvement can vary. Secondly, and more importantly, field study samples of professional pickpockets, motorcycle gang members, black heroin addicts, and white polydrug users are targeted in depth to demonstrate the specific nature and extent of their drugs/crime involvement.

LAW ENFORCEMENT VERSUS SOCIOLOGICAL PERSPECTIVES

Use of narcotic drugs was apparent in this country before the Revolution; by the 19th century, opium and its derivatives were readily available as general remedies over the counter and through the mails (Carson 1961; DiCyan and Hessman 1972; Consumer Reports 1971). However, law enforcement agencies and the general public expressed increasing concern over the growing evidence of addiction by mid-century (Wood 1856; Terry and Pellens 1928; Inciardi 1974) and the flourishing of opium dens, imported by Chinese immigrant laborers. (Soule et al. 1855; Asbury 1933; Bean 1968; Gong 1930; and Bode 1896. Comments on 19th-century addiction are also in Buel 1891; Crapsey 1872; Lening 1873; and Byrnes 1886.)

The Harrison Act of 1914, by removing narcotics from the legal marketplace, institutionalized the criminal labeling of every narcotics user in the Nation. Going beyond the definition of narcotic possession and use as a reflection of criminality, the law encouraged the interpretation that users of heroin, opium, and morphine were "forced into a life of crime" (King 1972; Musto 1972). It was suggested that, since narcotics thus became available only through nonlegal sources, the drug black market could demand a price structure which was beyond the normal purchasing power of most users; as a result, addicts were *forced* into a life of crime to secure the funds necessary to support their drug taking.

This latter view, however, was seemingly disregarded by the law enforcement sector, which preferred the notion that the drug user was not a victim of legislative circumstance, but rather a hardened criminal who should be the object of vigorous police surveillance. The Federal Bureau of Narcotics, for example, maintained that the majority of narcotics users they encountered were indeed firmly entrenched members of the underworld, and addiction was simply an added component of their criminal careers. Indeed, an early (1939) report of the Bureau highlighted the overwhelming majority of narcotics users as having criminal histories which well preceded their careers in addiction; similarly, of more than 200 "criminal addicts" studied by the U. S. Public Health Service, all were noted to have committed a crime before their use of narcotics had begun.

By the 1950s, Harry J. Anslinger, then Director of the Federal Bureau of Narcotics, had become the major spokesperson for law enforcement's interest in the subject (Anslinger 1951):

> The problem of narcotic drugs should be of vital interest to all law-enforcement officers. That *crime* and *narcotics* are interwoven is illustrated by the fact that violators of the narcotic laws head the list of all criminals in the United States having previous fingerprint records. This list includes persons convicted of offenses ranging from vagrancy to robbery, forgery, counterfeiting, burglary, and other crimes. Of the narcotic law violators arrested during a recent year, 63 percent had previous records and arrests, whereas in the general arrests 42 percent of the persons arrested had previous fingerprint records.

Data which have since been offered by diverse empirical studies and independent research efforts have tended to support the position of law enforcement. A U.S. Department of Health, Education, and Welfare report (1963) stated that most addicts committing serious offenses were previously criminal; 72 percent of 4,385 heroin users identified by the FBI had arrests for some other criminal act prior to their first narcotic arrest (President's Commission 1967); in New York State, 72 percent of 150 male addict-parolee studies were found to be criminal prior to their onset of drug use (Stanton 1969); and an analysis of the life histories of 169 Mexican Americans treated at the Clinical Research Centers of the National Institute of Mental Health at Lexington, Kentucky, and Fort Worth, Texas, found that 62 percent of the cases had criminal involvement prior to their addiction. (Chambers et al. 1970). A recent study in support of this position involved interviews with 50 black addicts in the District of Columbia (Plair and Jackson 1973). Although the inquiry was specifically directed to narcotic use and crime, the authors were unspecific as to the actual crime-drugs sequence; they did state, however, that the "criminal activity appeared to be a part of the lifestyle of the addicts at the onset of addiction."

In a contrasting perspective, researchers and clinicians have offered data suggesting that in the majority of cases, criminal involvement occurs subsequent to the onset of addiction and that criminal behavior represents the avenue of supporting one's addiction to drugs. During the 1930s, Dai (1937) found that as many as 81 percent of 1,047 Chicago arrestees became criminal subsequent to addiction, and in the following decade, Pescor's study of 1,036 patients at Lexington found that 75 percent of the cases were addicts first (Pescor 1943). Furthermore, Pescor's findings demonstrated that records of delinquency developed subsequent to addiction in 86 percent of the cases. In addition, the sequence of addiction prior to crime was found to be characteristic of: 100 percent of the 137 Chinese addicts studied by Ball and Lau (1966); 70 percent of the Lexington patients studied by DeFleur et al. (1969); 73 percent of the 94 addict-probationers treated at the Washington Heights Rehabilitation Center in New York City (Brill and Lieberman 1970); and 63 percent of 266 Kentucky residents who were treated for narcotic addiction at the Clinical Research Center (O'Donnell 1966).

The empirical data offered by the alternative positions on the addiction-crime/crime-addiction progression have extended only minimal understanding of the initial inquiries, and numerous interpretive analyses of these same data from secondary postures have only served to further confound the primary issues. The bases for the empirical and interpretive diversity are numerous, and some commentary is offered in the next section in an attempt to mitigate such conflict.

RESEARCH PERSPECTIVES—THE CRIMINAL MODEL OF DRUG ABUSE

An exhaustive examination of the research focusing on the possible relationships between drug use and crime will not be undertaken here. The reader is referred to other authors who have addressed this issue (Winick 1967; Kavaler 1968; Chambers 1974; Greenberg and Adler 1974; Austin and Lettieri 1976). However, it must be noted that the drug abuse literature relating to this issue is replete with judgments, impressions, and hypotheses which are often stated as conclusions and which have resulted in numerous contradictions in the state of the art. Furthermore, much of the data have been of a biased nature and have often been misrepresented or otherwise misinterpreted.

For example, one drug issue prone to misinterpretation is that of the types of crime perpetrated by addicts. Kolb (1962) has indicated that, shortly after the Harrison Act was passed, there was a widespread belief that 25 percent of all crimes were committed by addicts, and such offenses were due to the alleged "maddening" effect of narcotics. This latter notion, that addicts were prone toward violent crime, represented an initial stimulus for the ensuing discussions and debates relative to the relationship between narcotic addiction and crime.

Writers of popular articles and other forms of mass media literature during the first few decades of this century continued to attribute much violent crime to the addict. Kolb's 1925 analysis concluded that all preparations of opium capable of producing addiction tended to inhibit aggressive impulses, and furthermore, the soothing narcotic properties of the opiates had the effect of making psychopaths less likely to commit crimes of violence (Kolb 1925). Yet in spite of Kolb's attempt to alter certain attitudes regarding addict-related crime, the publication of Lindesmith's portrait of "dope fiend" mythology documented that individuals addicted to narcotic drugs were still regarded as the most dangerous of criminals and were linked to a high incidence of murder and rape (Lindesmith 1940). More recently, however, much of the substance of these beliefs and myths has been disappearing, at least in the professional literature. The Council on Mental Health of the American Medical Association (1957), for example, has clearly stated that the idea that opiates per se directly incite otherwise normal persons to violent assaultive criminal acts, including sexual crimes, is not tenable, and the report of the President's Commission of Law Enforcement and Administration of Justice (1967) has expressed a similar view.

In examining analyses of addict-crime, only minimal data are available relative to types of offense behavior on a longitudinal basis, and a number of others restricted themselves to observations of specific types of addicts. Yet others were geographically limited, as in the 1951 report by the Chicago Police Department which compared arrests by the City Narcotic Bureau (50 percent were for larceny-theft, 3 percent for aggravated assault) with arrests by the Police Department (31 percent and 31 percent for the same categories). In spite of these deficiencies in design and analysis, the overwhelming conclusions of the aggregate of studies are similar: that addicts are less involved in crimes against the person than property, and while a large portion of the reported arrests are for narcotics law violations, the most common nondrug-related offenses are of a mercenary, strictly profit-oriented nature. A recent analysis of addict-criminals (Inciardi and Chambers 1972), however, suggested that most also engage in violent personal offenses. Given these conflicting data, a large-scale empirical survey is warranted to establish the basic parameters of the structure and process of addict criminality.

During the last three decades, dozens of research endeavors have examined the backgrounds of drug users to determine the nature and extent of their criminal involvement and its relationship to their drug taking. The procedures have generally included an examination of criminal histories before and after the onset of drug use. When the data indicated in a given study that the majority of subjects had no criminal record prior to the onset of addiction, it was generally concluded that addicts had been forced into predatory drug seeking behavior (Gould 1974; Schur 1962). By contrast, when the data emerged in a reverse direction, the interpretation was that most addicts were already members of criminally involved subcultures at the time of their drug onset, and that addiction was therefore a characteristic of crime-prone populations (State of New York 1972). Yet other conclusions have been that when levels of arrest decrease subsequent to drug users' admissions to treatment programs, rehabilitation tends to reduce their criminality (Research Triangle Institute 1976). In summary, several general comments might be presented regarding these studies and the chronological onset of drug-seeking behavior and criminality.

1. Almost invariably, the conclusions are based on biased samples. The populations studied are drawn either from treatment settings or cohorts of arrested addicts. As such, there is a bias in the direction of the more dysfunctional users or those who are indeed criminally involved, to the exclusion of all other cases which have not come to the attention of official agencies.
2. The criminal career data of the cases studied are generally drawn from arrest records; the unreliability and incompleteness of official criminal statistics have been well documented (Inciardi and Chambers 1972).
3. Finally, the vast majority of studies typically relate to "narcotic addicts" or "drug users" as a homogeneous population, disregarding the component subpopulations with potentially different involvement with crime.

While there are some studies which represent exceptions to these general comments, these limitations are true of the overwhelming majority. Given this situation, it is apparent that there is clearly conflicting "evidence" on the most basic issues. A report issued by the Research Triangle Institute (1976) discusses the current state of empirical data on drug use and crime, as presented by the National Institute on Drug Abuse's Panel on Drug Use and Criminal Behavior:

> One of the Panel's initial problems was to determine whether convincing empirical data on drug use and crime were unavailable or available but inappropriately used. It was concluded that *data are generally unavailable—the principal reason being the lack of a long-term, well-coordinated, policy-relevant research program in the area.* Furthermore, studies differ in methodology and in definitions and measurements of crime, criminal behavior, and drug use. As a result, few studies can be compared and few generalizations can be derived. The field as a whole has little coherence because of the lack of emphasis and consensus on what is important to study.

Addressing the needs cited by the panel, the balance of this chapter will consider one perspective within which a portion of the drugs/crime question might be analyzed. This perspective is grounded in the recognition of varying "subpopulations" of drug users. That is, within the wider substance abusing population, there are various subgroups, and it is hypothesized that each such group may reflect differing patterns of use, criminal involvement, and drug taking/seeking behavior. Taking cognizance of the research weaknesses listed above, this supposition will be explored through studies of groups of drug users who are currently active in the street as well as those who are in a treatment setting. (Data from field research will support the former; data from NDACP and hospital emergency room cases will underlie the latter.) In addition, criminal career data will be drawn from user testimony rather than official arrest records; patterns of alcoholism and multidrug use will be noted as is relevant.

SELECTED TREATMENT POPULATION DATA BASES

Emergency Room Data Base

In 1972, an acute drug reactions project was initiated at the University of Miami School of Medicine to investigate and assess post-emergency medical, social, and psychological services for drug-related emergency cases. The project was based at Miami's Jackson Memorial Hospital, a county facility having the fourth largest emergency room in the nation and processing more than 2,000 drug patients per year. During the course of the research, a nonhomogeneous group of 309 acute drug reactions patients from the Dade County area were interviewed at length. These 309 respondents were a nonrandom sample drawn from a total of 2,198 persons receiving drug emergency care at Jackson Memorial Hospital from August, 1975 through April, 1976, on the basis of their availability and willingness to be interviewed. In a parallel project utilizing the same time frame and procedures for case selection, corresponding data were collected on 527 drug emergency patients at Denver General Hospital (Inciardi et al. in press). As indicated in table 1, the primary substances responsible for the patients' admissions differed somewhat for the two hospitals. For both, however, central nervous system depressants were clearly the major cause of hospital admission, followed by narcotics.

Client Characteristics

In an effort to make some preliminary observations of the characteristics of alternative types of drug users, three subpopulations have been drawn from each of the hospital samples. The basis of selection was the substance primarily responsible for the patients' need for emergency service, and as indicated in table 1, the three largest groups were the users of minor tranquilizers, sedatives, and narcotics. An overview of these subpopulations offers some immediately observable differences. In Miami, for example, the minor tranquilizer cases were more often female than male, the largest age-specific cohort was in the 18- to 34-year-old range, and more than two-thirds were white (almost a fifth were Hispanic). By contrast, the narcotics users were more often male, the majority were in the 25- to 34-year-old group, and blacks represented the largest ethnic cohort (48.3 percent). The sedative users were predominantly white (81 percent), more than half were under age 25, and males predominated.

The Denver groups also reflected some differences among each other, yet most of the clusters were not altogether unlike the Miami cohorts. Again, the tranquilizer users were primarily white females concentrated in the 18- to 34-year range; narcotics users were overwhelmingly male, in the 25- to 34-year-old group (here, white and Hispanics dominated); the sedative cases tended to be white (63 percent) and almost evenly male/female, distributed in the 18- to 49-year range.

Extent of Drug Use

The extent of drug use differed for the various groups. Narcotics cases in both cities, for example, had been using their primary drug considerably longer than those in the other two subgroups of users, and they began using narcotics at a younger age. Interestingly, however, while some 93 percent of the Miami narcotics cases used their primary drug at least once a week with 89 percent of these (n = 48) using on a daily basis, the Denver narcotics cases were not as heavily involved—62 percent were using the primary substance at least once a week with 61 percent of these (n = 14) using daily. Also in both samples is an indication of how the primary drug was obtained; street sales were the common transfer agent for narcotics (76 percent

TABLE 1.—*Primary substance responsible for admittance, Miami and Denver drug emergency patients, 1975–1976*

Substance	Miami		Denver	
	n	Percent	*n*	Percent
Minor tranquilizers	47	15.2	133	25.2
Major tranquilizers	21	6.8	28	5.3
Barbiturates	41	13.3	41	7.8
Other sedatives	37	12.0	12	2.3
Unknown sedatives	3	1.0	1	0.2
Heroin, opium	50	16.2	35	6.6
Methadone	8	2.6	2	0.4
Other narcotics	4	1.3	14	2.7
Analgesics	11	3.6	18	3.4
Miscellaneous prescriptions	10	3.2	48	9.1
Over-the-counter drugs	15	4.9	75	14.2
Antidepressants	5	1.6	8	1.5
Amphetamines	5	1.6	31	5.9
Other stimulants	1	0.3	2	0.4
Cocaine	7	2.3	2	0.4
Marijuana	5	1.6	2	0.4
Hallucinogens	6	1.9	26	4.9
Inhalants	4	1.3	2	0.4
Poisons	5	1.6	2	0.4
Unknown substance	7	2.3	16	3.0
No data	17	5.5	29	5.5
Total	309	100.1[1]	527	100.0

[1] Percentages do not actually total 100 because of rounding.

TABLE 2.—*Criminal involvement of Miami and Denver emergency room drug reaction patients, for 3 subgroups*

Criminal involvement	Minor tranquilizers		Sedatives		Narcotics	
	n	Percent	*n*	Percent	*n*	Percent
Miami:						
Ever arrested	24	51.1	54	69.2	50	86.2
Arrested by age 17	11	23.4	24	30.8	14	24.1
Arrested by age 25	20	42.6	48	61.5	42	72.4
Ever convicted	10	21.3	34	43.6	29	50.0
Ever committed a:						
drug law violation	11	23.4	32	41.0	21	36.2
drug-related crime against property	11	23.4	22	28.2	27	46.6
drug-related crime against person	3	6.4	11	14.1	7	12.1
Total[1]	47		78		58	
Denver:						
Ever arrested	60	45.1	29	54.7	34	91.9
Arrested by age 17	20	15.0	13	24.5	24	64.9
Arrested by age 25	47	35.3	25	47.2	33	89.2
Ever convicted	30	22.6	20	37.7	24	64.9
Ever committed a:						
drug law violation	14	10.5	9	17.0	23	62.2
drug-related crime against property	13	9.8	6	11.3	8	21.6
drug-related crime against person	7	5.3	3	5.7	7	18.9
Total[1]	133		53		37	

[1] Due to multiple categories, items add to more than 100 percent.

Miami, 92 percent Denver) but were less common for sedatives (41 percent, 34 percent, and tranquilizers (8 percent, 15 percent).

Criminality of Drug Users

While these data were not collected for the purpose of studying the drug emergency patients' criminal involvement, some information on criminal patterns was nevertheless available. All patients were questioned as to whether they had ever committed a drug law violation, a drug-related crime against property or a drug-related crime against person, and as indicated in table 2, the tranquilizer cases reported these crimes least often, followed by the sedative cases; the narcotics cases generally indicated the greatest criminal involvement. Secondly, in terms of self-reported arrests and convictions, narcotics cases ranked highest, sedative cases ranked second, and tranquilizer cases third.

Criminality of Alcohol Users

Some interesting comparative data can be offered relative to 217 cases in Miami and 478 cases in Denver, whose emergency care involved alcohol as the primary substance related to hospital admission. These persons were also interviewed during the August, 1975 to April, 1976 study period and were selected for study in the same manner as the drug emergency patients. The alcohol emergency patients were primarily male (75 percent in Miami and 83 percent in Denver), with the majority in both cities being whites aged 35 years and above. Essentially, these alcohol cases reflect many of the characteristics of a skid-row population, characterized by overwhelming numbers who are white, male, unemployed, and aging. A substantial proportion reported a pattern of heavy drinking and multiple treatment experiences. These individuals were also involved with other drugs, primarily sedatives, tranquilizers, and marijuana. Interestingly, this group reported proportionately more arrest histories than did the drug cohorts, which may be explained by the ages of the groups. For example, 66.7 percent of the total Miami drug respondents reported arrests as compared to 83.9 percent of the Miami alcohol respondents; for Denver, 51.6 percent of the drug respondents reported arrests compared with 81.2 percent of the alcohol respondents. These arrests, however, were typically alcohol-related "victimless crimes," such as public intoxication, vagrancy, and drunkenness.

In retrospect, these data suggest that substance abusers vary according to demographic characteristics, extent of use, and criminality. Furthermore, differences also seem to be manifest from one city to another; what may be evident among tranquilizer cases in one area, for example, does not necessarily hold true in another. Some of the discrepancy can be attributed to the fact that the population bases serviced by the two hospitals are different, as are the availability of drugs and the opportunities for committing crime. More important, however, is the recognition that abuser cohorts (as determined by primary drug) do indeed differ, as will be more readily evident in the following data analysis.

NDACP Data Base

The National Drug/Alcohol Collaborative Project (NDACP), sponsored by the National Institute on Drug Abuse, began in 1975 in an attempt to examine the extent to which drug and alcohol problems were interrelated. The NDACP data file contains 1,544 cases, and while they were drawn from various areas in the country and from projects and programs with variable selection criteria, they nevertheless provide the opportunity for examining the criminality of numerous types of drug users.

From the total sample of 1,544, the cases have been grouped here into the following 11 categories:

	n
1. Regular users of *heroin*	451
2. Regular users of *illegal methadone*	69
3. Regular users of *other opiates*	197
4. Regular users of *amphetamines*	325
5. Regular users of *barbiturates*	227
6. Regular users of *minor tranquilizers*	277
7. Regular users of *marijuana*	668
8. Regular users of *alcohol*	944
9. Nonexperimental users of *cocaine*	274
10. Nonexperimental users of *inhalants*	149
11. Nonexperimental users of *hallucinogens*	268

As such, these categories are by no means mutually exclusive, and a regular user of any given substance can appear in one or more other user cohorts. In this data file, furthermore, "regular use" has been defined as use "nearly every day for at least 1 month"; "nonexperimental use" has been defined as use "more than just a few times".

In table 3, some basic demographic characteristics of each of the 11 categories of users can be contrasted with 1 another and with the total NDACP

TABLE 3.—*Basic demographic and social characteristics, in percent*

Characteristics (n)	Heroin (451)	Illegal methadone (69)	Other opiates (197)	Cocaine (274)	Amphetamines (325)	Barbiturates (227)	Minor tranquilizers (277)	Alcohol (944)	Inhalants (149)	Hallucinogens (268)	Marijuana (668)	Total NDACP (1544)
Sex:												
Male	80.3	76.8	79.7	81.8	76.6	73.1	75.1	81.4	82.6	76.9	75.3	77.7
Female	19.1	23.2	19.8	17.5	22.5	26.9	24.9	18.1	16.8	21.6	24.0	21.8
No data	0.6	0.0	0.5	0.7	0.9	0.0	0.0	0.5	0.7	1.5	0.7	0.6
Ethnicity:												
White	36.8	31.9	67.5	42.0	73.8	77.5	66.8	57.4	76.5	85.1	68.7	63.9
Black	59.2	66.7	30.5	55.1	20.9	18.5	32.5	38.8	13.4	9.3	26.5	31.6
Other, no data	4.0	1.4	2.0	2.9	5.2	4.0	0.7	3.8	10.1	5.6	4.8	4.5
Age (at interview)												
11–17	0.4	0.0	3.0	5.8	9.5	6.6	2.5	5.9	22.8	17.9	22.2	n.d.
18–24	24.6	15.9	29.4	27.4	33.5	33.0	23.8	21.7	38.9	45.9	35.9	n.d.
25–34	49.4	60.9	40.1	42.7	40.9	41.9	39.0	31.8	31.5	32.1	29.3	n.d.
35–49	19.7	14.5	20.3	19.7	11.4	14.1	26.0	28.0	2.0	1.1	9.1	n.d.
50–68	2.0	2.9	3.6	2.6	1.8	1.8	7.6	10.5	0.7	0.0	0.7	n.d.
No data	3.8	5.8	3.6	1.8	2.8	2.6	1.1	2.1	4.0	3.0	2.7	n.d.
Education:												
Less than high school	53.7	44.9	50.8	48.5	51.7	47.1	52.0	57.7	63.1	53.0	58.7	59.6
High school	28.8	36.2	29.4	32.1	25.5	29.5	27.1	25.7	17.4	28.4	24.9	23.4
GED, trade	12.2	13.0	13.7	15.3	15.1	13.7	11.9	9.5	15.4	12.7	10.3	9.5
College or more	1.8	2.9	4.1	0.7	4.3	7.5	5.1	3.1	1.3	2.6	2.7	3.4
No data	3.5	2.9	2.0	3.3	3.4	2.2	4.0	3.9	2.7	3.4	3.4	4.1
Usual occupation:												
Professional-manager	5.8	10.1	8.1	8.0	5.5	11.0	7.6	5.6	6.7	6.3	5.8	5.9
Sales-clerical	10.0	15.9	9.1	11.7	7.4	10.6	10.1	8.8	6.7	8.6	7.5	8.0
Skilled-semiskilled	31.9	31.9	29.9	28.5	31.1	22.9	29.2	28.9	25.5	26.9	22.0	25.8
Unskilled	37.7	33.3	38.1	35.0	32.6	33.5	38.6	39.0	30.9	29.1	26.3	32.4
Student	0.2	0.0	1.0	1.5	1.8	2.6	1.4	1.6	6.7	4.1	6.9	(27.9)
Other, no data	14.4	8.7	13.7	15.3	21.5	19.4	13.0	16.1	23.5	25.0	31.4	

n.d. = no data.
Source: NDACP Final Report, 1977 (National Institute on Drug Abuse, 1980).

file. (Differences tend to be most apparent for some age categories.) Among the users of heroin, illegal methadone, and cocaine, blacks are well overrepresented, while whites are significantly dominant among users of amphetamines, barbiturates, inhalants, and hallucinogens. In terms of median age the following variations were observed: inhalants 22.1, hallucinogens 22.3, marijuana 22.9, amphetamines 25.2, barbiturates 25.8, cocaine 26.8, other opiates 26.8, heroin 27.6, illegal methadone 28.7, minor tranquilizers 29.1, and alcohol 29.9.

The youngest groups included the nonexperimental users of inhalants, hallucinogens, and marijuana, while the oldest groups incorporated the regular users of narcotics, tranquilizers, and alcohol. Interestingly, this rank order is not altogether unlike that of the median ages of first use of the given drug, as follows: inhalants, 13.5; alcohol, 13.8; marijuana, 14.6; hallucinogens, 16.3; amphetamines, 17.6; barbiturates, 18.1; heroin, 18.2; other opiates, 19.6; cocaine, 19.6; minor tranquilizers, 23.0; illegal methadone, 24.0. It can be seen in these data, for example, that nonexperimental users of inhalants were not only the youngest group in the NDACP file, but also reflected the youngest onset age. The major variation in this pattern occurs with the regular users of alcohol who represented the oldest group in the treatment population while having the second youngest onset age. This difference might be mitigated by the fact that among all the 11 user groups, except alcohol, the median age at regular use and the median age of first use were separated by approximately only 1 year; in the case of alcohol, the onset of regular use and the age of first regular use were separated by 5.4 years.

Additional differences between the 11 groups relative to multiple drug use are manifest in table 4. Regular users of illegal methadone appear to be the most involved with other drugs in that some 91.3 percent are also regular users of heroin; more than half are also regular users of cocaine, alcohol, and marijuana; and more than 40 percent are also regular users of other opiates and barbiturates. High levels of mixed drug use also appear with respect to the barbiturate, other opiate, cocaine, hallucinogen, and inhalant groups. By contrast, regular users of heroin, marijuana, and alcohol appear to be less involved with other drugs. In terms of this regular use of other drugs, these 11 user groups can be ranked as follows:

1. Illegal methadone
2. Barbiturates
3. Other opiates
4. Cocaine
5. Hallucinogens
6. Inhalants
7. Amphetamines
8. Minor tranquilizers
9. Heroin
10. Marijuana
11. Alcohol

Also evident in table 4 is that the regular use of alcohol and marijuana occurs in high proportions in most user groups. By contrast, the regular use of narcotics and other sedatives is comparatively low in the inhalant, hallucinogen, and marijuana user groups; the regular use of narcotics, stimulants, inhalants, and hallucinogens is comparatively low in the alcohol and tranquilizer user groups; and the use of hallucinogens and inhalants is comparatively low in the narcotics, sedatives, and stimulant user groups.

Criminal Activity: Extent

While NDACP data on criminal involvement are generally limited to arrests and convictions, some distinctions are nevertheless evident. Moreover, one cannot describe the motive for the crime (e.g., drug related, person, property) as is possible in the emergency room study. As indicated in Table 5, most of the users in all 11 groups reported illegal activity. These proportions have been translated into rankings in Table 6, which provide a basis for comparing their alternative criminal involvement. Table 7 summarizes these rankings by simply adding the ranking figures, and then working with both the resulting sums and the ranks of the sums. (A detailed discussion of the mathematical manipulations in tables 5, 6 and 7 appears in appendix A). The resulting data base creates four groupings of likelihood of criminal involvement, as well as an overall ranking of the user groups:

Very high likelihood:

1. Inhalants
2. Heroin
3. Cocaine
4. Other opiates
5. Illegal methadone

High likelihood:

6. Barbiturates
7. Amphetamines

Lower likelihood:

8. Hallucinogens
9. Minor tranquilizers

Lowest likelihood:

10. Marijuana
11. Alcohol

Thus, when one considers not only reported criminal activity but also degree of involvement with the criminal justice system, the range of offenses resulting in conviction, and extent of early criminal involvement, the rankings are somewhat different than might be apparent at first. Most notably, the

TABLE 4.—*Multiple drug use: regular (or nonexperimental) use of other drugs, in percent*[1]

Drugs used regularly (*n*)	Heroin (451)	Illegal methadone (69)	Other opiates (197)	Cocaine (274)	Amphetamines (325)	Barbiturates (227)	Minor tranquilizers (277)	Alcohol (944)	Inhalants (149)	Hallucinogens (268)	Marijuana (668)	Total NDACP (1544)
Heroin		91.3	61.9	70.1	44.3	48.0	42.2	28.9	32.9	36.3	38.3	29.2
Illegal methadone	14.0		14.7	16.8	5.2	12.3	9.4	5.3	6.7	3.4	7.0	4.5
Other opiates	27.1	42.0		25.5	24.3	40.1	30.0	13.0	23.5	23.9	17.5	12.8
Cocaine	42.6	66.7	35.5		28.3	37.0	24.9	19.5	26.8	33.6	28.7	17.7
Amphetamines	31.9	24.6	40.1	33.6		49.3	36.8	21.2	38.3	52.2	34.3	21.0
Barbiturates	24.2	40.6	46.2	30.7	34.5		36.5	15.7	34.9	35.1	23.4	14.7
Minor tranquilizers	25.9	37.7	42.1	25.2	31.4	44.5		20.3	25.5	25.7	19.5	17.9
Alcohol	60.5	72.5	62.4	67.2	61.5	65.2	69.3		65.1	61.9	58.8	61.1
Inhalants	10.9	14.5	17.8	14.6	17.5	22.9	12.6	10.3		28.7	16.0	9.7
Hallucinogens	21.7	13.0	32.5	32.8	43.1	41.4	24.9	17.6	51.7		32.2	17.4
Marijuana	56.8	68.1	59.4	70.1	70.5	66.7	46.9	41.6	71.8	80.6		43.3
Mean percent using any other drug regularly	31.5	47.1	41.3	38.7	36.1	42.7	33.4	19.3	37.7	38.2	27.6	

[1] Percentages add to more than 100 percent due to regular use of more than one drug.

Source: NDACP Final Report, 1977 (National Institute on Drug Abuse, 1980).

TABLE 5.—*Extent of criminal involvement, in percent*[1]

Criminal involvement (n)	Heroin (451)	Illegal methadone (69)	Other opiates (197)	Cocaine (274)	Amphetamines (325)	Barbiturates (227)	Minor tranquilizers (277)	Alcohol (944)	Inhalants (149)	Hallucinogens (268)	Marijuana (668)
Ever:											
Picked up	93.1	94.2	91.4	93.8	87.7	86.3	84.1	82.3	93.3	86.6	81.3
Arrested	90.2	94.2	89.3	90.1	79.1	81.5	76.9	77.9	84.6	76.5	71.1
Convicted	79.4	84.1	77.7	78.1	68.0	69.2	66.4	64.9	69.1	60.1	53.9
Incarcerated	76.5	82.6	66.5	74.1	60.6	63.0	61.7	60.0	62.4	49.6	49.7
By age 17:											
Picked up	62.3	58.0	64.5	67.5	64.6	64.3	55.6	47.9	83.9	70.9	63.5
Arrested	48.1	49.3	50.8	54.0	49.2	52.4	43.3	37.5	67.1	53.0	45.4
Convicted	45.5	34.8	36.0	36.5	36.3	37.4	31.4	25.0	48.3	36.2	26.9
Incarcerated	29.9	29.0	26.4	29.6	28.0	26.9	25.3	20.9	34.2	23.9	21.4
Currently:											
On probation	26.8	20.3	29.4	28.8	29.2	28.6	27.8	23.6	36.9	32.5	26.2
On parole	19.3	15.9	19.3	13.1	15.1	10.6	10.8	7.1	10.1	6.3	8.2
Awaiting trial	7.8	2.9	12.2	9.9	7.7	8.4	9.0	6.4	9.4	10.4	8.4
Mental C: legal	7.5	1.4	7.6	3.6	5.2	4.0	4.3	4.8	2.7	3.4	4.3
Mental C: voluntary	9.8	2.9	10.7	8.8	11.7	11.5	12.6	14.5	10.7	11.2	9.3
No legal status	43.5	59.4	35.0	44.9	39.7	44.5	44.4	50.1	34.2	39.6	48.5
Convicted of:											
Narcotic possession	39.5	37.7	38.1	39.8	27.4	30.4	20.6	16.0	22.1	23.9	22.8
Driving while intoxicated	6.2	1.4	10.7	8.0	13.8	13.7	15.2	15.6	10.7	11.9	7.5
Drunkenness	5.1	7.2	13.7	7.7	11.4	13.7	11.6	16.2	11.4	8.2	7.0
Disorderly conduct	16.6	17.4	22.3	20.1	19.7	22.0	19.9	17.2	22.1	16.8	12.1
Weapons offense	16.9	18.8	19.8	13.5	13.2	11.5	14.1	10.8	17.4	9.0	9.3
Assault	12.9	11.6	14.7	12.0	12.6	12.3	9.0	10.3	16.8	10.5	7.9
Larceny	35.3	37.7	36.0	32.8	25.2	27.3	23.8	18.3	30.2	20.5	20.2
Stolen property	18.4	21.7	18.8	16.4	12.6	14.5	12.6	10.2	15.4	11.9	10.3
Parole violation	20.4	13.0	20.8	18.6	17.2	16.7	14.8	10.7	15.4	11.9	10.8
Reports no illegal activity	6.0	7.2	14.2	6.6	13.2	13.2	29.2	28.5	11.4	9.3	16.2

[1] Will not add to 100 percent because of overlapping categories.

Source: NDACP Final Report, 1977 (National Institute on Drug Abuse, 1980).

TABLE 6.—*Extent of criminal involvement, ranked (from table 5) highest (1) to lowest (11)*

Criminal involvement	Heroin	Illegal methadone	Other opiates	Cocaine	Amphetamines	Barbiturates	Minor tranquilizers	Alcohol	Inhalants	Hallucinogens	Marijuana	Range, based on table 5 in percent
Ever:												
Picked up	4	1	5	2	6	8	9	10	3	7	11	94.2–81.3
Arrested	2	1	4	3	7	6	9	8	5	10	11	94.2–71.1
Convicted	2	1	4	3	7	5	8	9	6	10	11	84.1–53.9
Incarcerated	2	1	4	3	8	5	7	9	6	11	10	82.6–49.6
By age 17:												
Picked up	8	9	5	3	4	6	10	11	1	2	7	83.9–47.9
Arrested	8	6	5	2	7	4	10	11	1	3	9	67.1–37.5
Convicted	2	8	7	4	5	3	9	11	1	6	10	48.3–25.0
Incarcerated	2	4	7	3	5	6	8	11	1	9	10	34.2–20.9
Currently some legal status	5	11	2	8	4	7	6	10	1	3	9	65.8–40.6
Convicted of:												
Disorderly conduct	10	7	1	4	6	3	5	8	2	9	11	22.3–12.1
Weapons offense	4	2	1	6	7	8	5	9	3	11	10	19.8–9.0
(Other) assault	3	7	2	6	4	5	10	9	1	8	11	16.8–9.0
Larceny	3	1	2	4	7	6	8	11	5	9	10	37.7–18.3
Stolen property	3	1	2	4	7.5	6	7.5	11	5	9	10	21.7–10.2
Parole violation	2	8	1	3	4	5	7	11	6	9	10	20.8–10.7
Reports no illegal activity (reverse order)	1	3	8	2	6.5	6.5	11	10	5	4	9	6.0–29.2

inhalants group moves from a rank order of 5 (table 6) to a rank order of 1 (table 7), and the hallucinogens and other opiates groups change places; the other opiates group appears to be about as likely to be involved in crime as heroin and illegal methadone users, while the hallucinogens group appears only about as involved as the minor tranquilizers users.

The broad range of items included in this assessment makes it clear that there is a consideraable range of variation between drug use categories in the matter of how involved in crime drug users may be. If all illicit-drug users were highly involved in crime, the rankings on these various indicators would be expected to vary more or less randomly; hence, the sums of the rankings would be relatively equal for the 11 user groups. But what table 7 shows is a distinctly *nonrandom* pattern of rankings. Hence, on a "final score" which could range from 31 (if a user group were ranked 1 on each and every item included in the score) to 341 (if a group were ranked 11 on each and every item), we find an actual range of 94 to 309—much greater variation than one would expect to find by chance. If one divides these scores by 31 (the minimum possible score), the result is an average ranking as follows:

1.	Inhalants	3.0
2.	Heroin	3.6
3.	Cocaine	3.9
4.	Other opiates	4.1
5.	Illegal methadone	4.8
6.	Barbiturates	5.6
7.	Amphetamines	6.0
8.	Hallucinogens	6.8
9.	Minor tranquilizers	8.3
10.	Marijuana	9.9
11.	Alcohol	10.0

This is the same ordering as given by the overall rankings stated previously, but what has been added here is a specification of how close—or far apart—some of the user groups are. Thus, for example, the seemingly greater criminality among inhalants users as compared to users of heroin or cocaine becomes less important than the high scores for all three of these groups.

TABLE 7.—*Extent of criminal involvement, ranked (from table 6) highest (1) to lowest (11) percentage involved, and totals*

Criminal involvement	Heroin	Illegal methadone	Other opiates	Cocaine	Amphetamines	Barbiturates	Minor tranquilizers	Alcohol	Inhalants	Hallucinogens	Marijuana	Possible points
Totals (sums) (sum of ranks in each of the five categories)												
Ever	10	4	17	11	28	24	33	36	20	38	43	4–44
By age 17	20	27	24	12	21	19	37	44	4	20	36	4–44
Status	5	11	2	8	4	7	6	10	1	3	9	1–11
Convictions	25	26	9	27	35.5	33	42.5	59	22	55	62	6–66
No illegal activity	1	3	8	2	6.5	6.5	11	10	5	4	9	1–11
A. Sum of totals	61	71	60	60	95	89.5	129.5	159	52	120	159	16–176
Total rankings (rankings on totals from above)												
Ever	2	1	4	3	7	6	8	9	5	10	11	1–11
By age 17	4.5	8	7	2	6	3	10	11	1	4.5	9	1–11
Status	5	11	2	8	4	7	6	10	1	3	9	1–11
Convictions	4	3	1	5	7	6	8	10	2	9	11	1–11
No illegal activity	1	3	8	2	6.5	6.5	11	10	5	4	9	1–11
B. Sum of total rankings	16.5	26	22	20	30.5	28.5	43	50	14	30.5	49	5–55
Final rankings[1] on sum of:												
Total (sums)	4	5	2.5	2.5	7	6	9	10.5	1	8	10.5	1–11
Total rankings	2	5	4	3	7.5	6	9	11	1	7.5	10	1–11
C. Both, combined	2	5	4	3	7	6	9	11	1	8	10	1–11
Final score[2]	110.5	149	126	120	186.5	175	258.5	309	94	211.5	306	31–341
Likelihood: Group[3]	Very high				High		Lower	Lowest	Very high	Lower	Lowest	

[1] Ranking on "Totals (sums)": Line A ranks as if each *entry* line (e.g. "Ever picked up") were equally important. Ranking on "Total rankings": Line B ranks as if each *category* (e.g., "Ever") is equally important. Since each method has obvious disadvantages, the two are combined in line C as well as in the final score (see footnote 2).

[2] The final score is the line A sum plus the line B sum, after the latter was multiplied by 3 to give it approximately the same range as the line A sum. The results show the *relative* likelihood of criminal involvement of the 11 groups.

[3] Likelihood of criminal involvement based on final score. See appendix A for a more detailed explanation.

TABLE 8.—*Effect of drug use on criminal behavior, in percent*

Drug-use effect	Heroin	Illegal methadone	Other opiates	Cocaine	Amphetamines	Barbiturates	Minor tranquilizers	Alcohol	Inhalants	Hallucinogens	Marijuana
n	(451)	(69)	(197)	(274)	(325)	(227)	(277)	(944)	(149)	(268)	(668)
Amount:[1]											
Increase	72.5	58.0	66.5	64.6	64.3	66.5	52.7	47.4	61.7	66.8	60.9
No effect	20.8	29.0	26.9	27.0	28.0	25.1	40.8	45.1	28.9	23.5	31.6
Decrease	4.9	7.2	3.6	6.2	3.4	3.1	4.0	4.8	6.7	5.2	4.8
No data	1.7	5.8	3.0	2.2	4.3	5.3	2.5	2.8	2.7	4.5	2.7
Violence:[2]											
Yes: alcohol	5.5	4.3	10.2	5.5	9.8	13.7	10.8	10.0	13.4	10.1	8.1
Yes: drugs	7.8	7.2	12.2	8.4	10.2	12.3	11.2	5.0	8.7	10.1	6.9
No	18.4	11.6	18.8	17.9	24.6	21.6	21.3	23.3	20.8	23.9	17.5
No data	68.3	76.8	58.9	68.2	55.4	52.4	56.7	61.8	57.0	56.0	67.5
Crime:[3]											
Under drug influence	47.2	50.7	48.7	48.2	36.6	38.3	29.2	20.2	29.5	34.0	28.3
Under alcohol influence	23.1	26.1	26.9	25.5	26.9	28.2	31.0	38.9	35.6	25.0	21.6
To support habit	44.1	55.1	40.1	40.9	25.8	29.1	22.0	19.6	22.8	19.4	21.6

[1] Item: "At the time you felt that drug/alcohol use was an important part of your life, did your illegal activity at that time. . ."

[2] Item: "Have you ever gotten angry or violent and *seriously injured* someone (needed medical attention) while under the influence of . . ."

[3] Offenses-convicted-of, only: for "the first reported offense" in all cases. Hence (*n*) is 100.0 percent, but the response percentages are separate "yes" answers for each line and therefore will not add to 100.0 percent.

Source: NDACP Final Report, 1977 (National Institute on Drug Abuse, 1980).

Overall, it appears that the opiate groups show the greatest involvement with the criminal justice system, compared to other substance categories.

Criminal Activity: Changes

Additional information on the various user groups' criminal involvement appears in table 8. All respondents in the NDACP were questioned: "At the time you felt that drug/alcohol use was an important part of your life, did your illegal activity at that time increase, decrease, or stay the same?" The highest proportions indicating increased criminal activity appeared with respect to heroin users; the lowest were in the minor tranquilizer group. Interestingly, the incidence of violence while under the influence of drugs, also indicated in table 8, was reported most often by persons in the barbiturate, other opiates, and minor tranquilizer groups. However, these figures must be viewed cautiously due to the large number of nonresponses.

Criminal Activity: Under the Influence of Drugs

Finally, higher proportions of users in the various narcotics subgroups reportedly committed crimes while under the influence of drugs, followed by the stimulant groups, with the lowest proportions in the alcohol cohort. However, while under the influence of alcohol, the alcohol users cohort indicated the highest proportions committing crimes, followed by the inhalant and minor tranquilizer groups. Lastly, the commission of crime for the support of a substance abuse habit was most prevalent among narcotics and stimulant users, ranked as follows:

	Percent
1. Illegal methadone	55.1
2. Heroin	44.1
3. Cocaine	40.9
4. Other opiates	40.1
5. Barbiturates	29.1
6. Amphetamines	25.8
7. Inhalants	22.8
8. Minor tranquilizers	22.0
9. Marijuana	21.6
10. Alcohol	19.6
11. Hallucinogens	19.4

While no strong generalizations can be made from these data, it is nevertheless apparent that different user groups reflect varying patterns of drug taking (i.e., multiple drug use) and differential involvement with crime. Furthermore, since each of the 11 user groups examined here is contaminated by inclusion of respondents from one or more other groups, even greater differences would likely emerge from more mutually exclusive samples.

FIELD STUDIES

As stated in the *Research Perspectives* section, the aims of this chapter include the discussion of active street users as well as those in treatment. Certainly, emergency room patients (Miami, Denver) and clients in treatment (NDACP) are useful in formulating large data bases for the study of criminality among drug/alcohol abusers. A further advantage, however, is offered by field studies; though necessarily limited in scope, they offer a more complete picture of the criminal/abuser in his/her natural, operational setting.

The vast body of literature describing the way of life of the professional criminal has documented the widespread use of opium and heroin among pickpockets, shoplifters, and other types of professional thieves. In addition to those professional offenders who, in their autobiographies, make reference to their own use of narcotics, the high incidence of drug use among such thieves has been noted in numerous other sources (Inciardi 1975). Maurer (1964) suggested that addiction among pickpockets was greater than in any other "racket," and the pickpocket's spouse as well was often addicted. And finally, numerous authors have noted that many professional thieves resorted to drugs as a relief from the pressures of their occupation and that such drug use also was a manifestation of one's "loss of nerve." Sutherland (1937) too, who provided the first comprehensive analysis of the social organization and occupational structure of the profession of theft, has also commented on this relationship.

The study of the relationship between crime and drugs within a functioning subgroup of the criminal population was therefore initiated through an analysis of drug-using pickpockets. During January 1975, 10 active professional pickpockets from Miami, Florida were interviewed regarding their drug taking and criminal careers (Inciardi 1977). As indicated in Table 9, all had begun their drug use subsequent to their criminal activity. All of these individuals were committed to a criminal lifestyle and had underworld involvement years prior to the onset of drug use. Most importantly, these individuals saw drugs as instrumental in furthering their careers; in most instances, the pickpockets had begun to "lose their nerve" while stealing, and drugs provided them with the perceived stability felt necessary for consummating a theft.

Using the professional thieves as a point of inquiry, the question arises whether there may be certain relationships between drugs and crime that are specific to given subpopulations. Three additional samples of substance abusers were therefore identified and analyzed by way of a pilot information base to address this issue. It should be emphasized here that the various substance-abusing cohorts described *do not* represent cross sections of any particular user groups from which generalizations can be drawn. Rather, it is intended primarily to illustrate that user groups do indeed vary, and that analyses of criminal involvement must address these variations.

Since these were pilot studies, sample cases were not drawn on a random basis, and all interviewing—which occurred in July 1977—was undertaken in an unstructured manner. The samples included 20 black heroin addicts from the Brownsville section of Brooklyn, New York; 9 amphetamine and barbiturate users from a motorcyle pack traveling through the Maryland peninsula; and 20 whites

TABLE 9.—*Selected characteristics of 10 drug-using pickpockets, Miami, 1975*

Age	Age at onset of criminal activity	Age at onset of drug use	Drug of abuse	Addicted	Total arrests
47	13	26	Heroin	Yes	20
62	25	26	Heroin	Yes	86
51	24	30	Barbiturates	Yes	30
49	30	40	Codeine	No	25
66	15	46	Heroin	Yes	40
50	19	21	Cocaine	No	25
49	13	21	Cocaine	No	35
48	12	23	Heroin	No	12
53	16	33	Codeine	No	17
50	16	29	Heroin	No	22

Source: Inciardi, James A. and Russe, Brian R. Professional thieves and drugs, *International Journal of the Addictions*, December 1977, p. 1093. Copyright 1977 by IJA.

with mixed addictions from New York City's "West Village."

The 20 black heroin addicts were located in Brooklyn's Brownsville, a multiethnic low income area of some 200 square blocks characterized by high rates of poverty, crime, slum dwellings, and drug addiction. This sample was based on a restricted quota draw rather than one derived through the use of a more sociometrically oriented model. The first respondent was selected from a street corner group on the basis of his willingness to participate in the research effort. During the course of this initial interview and all subsequent interviews at a time when interviewer-respondent rapport was deemed to be at its highest level, each respondent was requested to identify any other current heroin addicts known to him. These individuals, in turn, were located and interviewed until a quota of 20 was reached. This method, while nonrandom, nevertheless restricted the pool of potential respondents to "current" heroin users who were active in a given subcultural area and who were available for interview within the free community. The technique eliminated former users, recent users who were only peripheral to the mainstream of the subculture, and any users who were recent admissions to residential service or control programs. The sample of 20 heroin users consisted of males reflecting a median age of 19.3 years, with careers in drug use beginning prior to age 13. Their drug use typically began with codeine cough syrup, alcohol, and/or inhalants, followed by marijuana and sedative use by age 15. The median age of onset of heroin use was 16.7 years, with heroin addiction occurring at 17.5 years. At the time of interview, these individuals primarily used heroin combined with a high incidence of alcohol, marijuana, and cocaine.

All but two of the respondents reported criminal behavior occurring prior to any drug abuse. Criminal behavior as such was typically of a predatory nature, including purse snatching, shoplifting, and varieties of sneak theft. Only one reported violent crime prior to drug use. These addicts also maintained that their criminality remained at a relatively low level during these early years, although 14 of them were picked up by the police and 9 had juvenile records by age 12. During this preaddiction period, the level of criminal involvement remained relatively unchanged, with only three exceptions. Two individuals became involved in a series of armed robberies for which they were ultimately arrested, perpetrated for the purpose of going into business as operators of a record store. The third became involved in a street robbery (mugging), which he stated was unrelated to his use of drugs.

With the onset of heroin addiction, criminal behavior began to increase primarily for the purpose of supporting the drug habit. During the 30-day period prior to interview, three respondents indicated no criminal involvement and three stated that their criminality was limited to drug sales. For the remaining 14, crimes were reported as follows:

Offense	*Total offenses*	*Reporting*	
		Percent	*n*
Burglary	33	86	12
Shoplifting	30	79	11
Other sneak thefts	15	71	10
Vehicle thefts	3	7	1
Purse snatching	3	21	3
Armed robbery	2	7	1
Street robbery (mugging)	2	7	1

As such, during the 30-day period, a total of 88 crimes were committed by these 14 subjects, the vast majority of which could be termed as "drug related" in that they were committed in order to secure funds for purchasing drugs. None of these respondents was arrested for the crimes indicated, although 18 of the 20 had arrest records.

In terms of alcohol histories, such usage began at a median age of 12 years, but heavy drinking on a regular basis did not begin until after the onset of heroin addiction in the majority of cases (17). All of the respondents maintained that alcohol was not a contributing factor to their criminality. In fact,the majority agreed that the heavy use of alcohol often interrupted their typical courses of illicit drug-seeking behavior. It did appear, on observation, however, that the heavy use of alcohol combined with other drugs had increased their level of social dysfunctioning. Almost two-thirds of the group (13) used heroin, alcohol, and marijuana on a daily basis. Most admitted that the use of heroin generally occurred early in the day, followed by the heavy use of wine and marijuana which effected a heavily sedated state for the balance of the day. These individuals seemed totally unmotivated regarding employment, improvement of family or other social relations, or treatment.

The nine members of the motorcycle pack were interviewed in southern Delaware. They were from a larger group of bikers ($n = 30$) who alternatively spent their time on the Maryland peninsula; Suffolk County, New York (eastern Long Island); and Weirs Beach, New Hampshire; and were approached by the author as they crossed the Delaware/Maryland border. Entry to the group was obtained through one of its former members.

The group was composed of white males with a median age of 29.1 years, originating primarily from New York's Long Island. Their drug use began at considerably varying ages, with a median of 17.7 years and ranging from 13 to 27 years. Drug use in this group most often began with alcohol at age 15 followed by marijuana. At the time of interview, seven individuals were heavily into barbiturates or other sedatives, and two were primary amphetamine users. All were also using alcohol and marijuana, and two were involved in the sporadic use of heroin. None reported addiction to any drug.

Of the nine motorcyclists, only two admitted criminal involvement prior to drug use. Furthermore, while all indicated that they had committed crimes at one time or another subsequent to drug use, such crime seemed to be related to their membership in a motorcycle culture. Criminal activity was usually done in a group setting; it included such events as hijacking, burglary, drug sales, and assaults on rival gangs; and it was undertaken either as a peer group activity or for the purposes of general financial gain. During the 30 days prior to interview, only 2 of the 9 indicated criminal activity; this involved the breaking and entering of a car to obtain a CB radio. All indicated that sporadic work as opposed to criminal activity was their primary source of support.

The third sample consisted of 20 subjects with mixed addictions. The subjects were all white, 80 percent ($n = 16$) were male, and they ranged in age from 21 to 34 with a median age of 25.2 years. These individuals are best described as former members of the "new underground" of the 1960s; several were would-be avant-garde types who entered the Greenwich Village area after the onset of its decline as a bohemian enclave. This sample was selected in the same manner as the black heroin users. Of the 20 respondents, two were musicians, three were students, three were shopkeepers, and the balance (12) were unemployed—supported either by their parents, spouses, public assistance, or panhandling.

All of these subjects had mixed addictions and were attending local drug treatment programs on an ambulatory basis. Their addictions included tranquilizers and barbiturates ($n = 6$), heroin and barbiturates ($n = 4$), and sedatives (of various types) with alcohol ($n = 10$). Drug use in this group had begun with alcohol or marijuana at a median age of 16.9 years, followed by addiction to a primary drug or drug combination at a median of 20.2 years.

Of the 20 subjects, only 6 reported having ever committed a crime other than a violation of the drug laws. All of these six had committed crimes before drug use, maintaining that their rates of crime commission did indeed increase subsequent to the onset of their addiction. Furthermore, five of these six reported having arrest records; this included the four persons claiming heroin addiction.

These six individuals also reported high levels of criminal involvement during the 30 days prior to interview. Three subjects indicated that they engaged in at least one burglary per day, two engaged in prostitution, and one reported frequent thefts from vehicles. All reported illegal activity as a source of drug support.

The 10 subjects using sedatives in combination with alcohol seemed to have the highest levels of social dysfunctioning as a result of their drug involvement. None were employed and most (8) exhibited skid row-type behavior. Living adjacent to the northern end of New York's Bowery, these individuals regularly gravitated to this social half-world for the purposes of panhandling, drinking with local bottle gangs, and sleeping in sedated states while protected by the anonymity offered by the visible disorganization of the area. All claimed to be "in treatment" for alcohol use, but upon further inquiry it was learned that "treatment" as such amounted to no more than weekly contacts from outreach workers of the Salvation Army and the Alston Wilkes Society.

DISCUSSION

In retrospect, the data in these analyses clearly suggest that the relationship between drugs and crime is indeed a complex one. Some general observations can be made with respect to the two large data bases presented in this study. Among drug emergency patients, criminal involvement was reported least often by the tranquilizer cases and most often by the narcotics cases. While the alcohol users in this data set reported proportionately more arrest histories than did the drug cohorts, these arrests were typically for alcohol-related "victimless crimes." Among the NDACP clients, the users of inhalants, heroin, cocaine, other opiates, and illegal methadone had the highest likelihood of criminal involvement; the users of alcohol and marijuana had the lowest likelihood. The highest proportions of the NDACP population indicating increased criminal activity after addiction occurred among the heroin users; the lowest ratio was represented by tranquilizer users. The commission of a crime in support of a substance abuse habit was most prevalent among narcotics users.

In spite of the above general observations derived from large data bases, it is evident that any hypothesized link between drugs and crime can be assessed more significantly within the context of drug and criminal subcultures. The lifestyle of professional pickpockets, for example, may indicate the use of drugs as a mechanism for enhancing performance. The pickpockets examined here had been heavily involved in the underworld many years prior to their initiation into drug use; as property offenders, they felt that drugs served a specific purpose—that of steadying their nerves. As such, while their drug use was related to crime, their particular choice of criminal career might be considered as a "cause" of such use.

By contrast, the bikers interviewed indicated that their joint involvement with crime and drugs was more related to membership in a deviant subculture than to any other relationship. In the group with mixed addictions, few reported criminal activity; those who did, however, reflected a rather complex involvement. Crime was apparent before their addiction, but as drug use increased, crime similarly escalated—for the reported purpose of drug use support.

The data describing the 20 black heroin addicts suggest even further complexity in the drugs/crime

TABLE 10.—*Correlation of opiate use rates with rates of selected social casualty statuses for 30 health center districts, New York City, 1967*

New York City health center districts	Rank order of severity					
	Opiate use	Financial assistance	Juvenile delinquency	Out of wedlock births	Male unemployment	Poverty
Manhattan:						
Central Harlem	1	8	1	1	3	1
East Harlem	2	6	8.5	3	4.5	2
Kips Bay-Yorkville	20	28	29	17.5	19	21
Lower East Side	7	12	12	11	1	3
Lower West Side	4	17	15	16	2	12
Riverside	3	13	14	9	4.5	5
Washington Heights	8	16	13	15	15	15
Bronx:						
Fordham-Riverdale	22	20	26	23	23.5	20
Morrisania	5	2	8.5	6	8	8
Mott Haven	6	1	7	4	6.5	4
Pelham Bay	18	23	27	17.5	25	22
Tremont	12	10	11	10	16	14
Westchester	16	21	25	22	21.5	18
Brooklyn:						
Bay Ridge	27	27	24	30	20	23
Bedford	11	7	2	5	10	6.5
Brownsville	15	3	5	7	12	11
Bushwick	14	5	4	8	13	13
Flatbush	26	25	20	27	28	26
Fort Greene	10	4	3	2	11	9
Gravesend	23	18	19	25	17	17
Red Hook-Gowanus	9	11	6	13	9	6.5
Sunset Park	17	14	17	20.5	14	16
Williamsburg	13	9	10	14	6.5	10
Queens:						
Astoria-L.I.C.	21	22	23	26	23.5	19
Corona	25	26	21	20.5	21.5	28
Flushing	30	29	30	28	30	30
Jamaica East	19	15	16	12	26	27
Jamaica West	24	19	18	19	27	24
Maspeth-Forest Hills	29	30	28	29	29	29
Richmond	28	24	22	24	18	25
r		0.78	0.75	0.81	0.88	0.92

Source: James A. Inciardi, The Vilification of Euphoria: Some Perspectives on an Elusive Issue, *Addictive Diseases*, 1:262, 1974.
Copyright 1974 by *Addictive Diseases*.

issue. The overwhelming majority indicated predatory offense behavior prior to their careers in drugs, with increased criminal activity occurring only after the onset of addiction. This would suggest that crime was indeed related to drug use (as a source of drug support) after that point—but this conclusion leads to further inquiries. Initially, since their crime *increased* after addiction, what explains their original criminal behavior? Secondly, had they not been criminals previously, would they have suddenly begun to commit crimes at the onset of drug use? Would they in fact have begun to use drugs at all? This brings us to that "third factor" in the drugs/crime issue, one which suggests that perhaps substance abuse and crime are less related to each other than to one or more other phenomena.

In a previous study (Inciardi 1974), rates for various social casualty statuses including opiate use, financial assistance, juvenile delinquency, out-of-wedlock births, male unemployment, and poverty were ranked for each of New York City's 30 health center districts (Table 10) (aggregations of contiguous census tracts). As indicated in Table 10, opiate use was correlated with each of the other social problems to indicate unusually high statistical relationships:

	r
Opiate use/poverty	0.92
Opiate use/unemployment	0.88
Opiate use/illegitimacy	0.81
Opiate use/financial assistance	0.78
Opiate use/delinquency	0.75

This does not suggest that opiate use is the "cause" of any or all of these phenomena nor does it necessarily signify any reverse causation. Rather, it strongly suggests that these social casualty statuses tend to exist side by side, that the presence of one indicates the presence of the others, and that within given regions drugs and crime may be related aspects of general social disorganization.

Within this context, it must be emphasized that longitudinal studies must be undertaken on *defined* substance-abusing populations, with a concentration on criminal career patterns. Research at this level must be initiated before we can begin to further assess the impact of drug use on the nature and extent of crime.

BLANK PAGE

APPENDIX A

The data in tables 5, 6, and 7 represent a series of mathematical manipulations involving the ranking of proportions, summations and rankings, and then the ranking of summations for the purpose of indicating the relative likelihood of criminal involvement as suggested by the additive effects of numerous variables. For heroin users, for example, 93.1 percent reported being picked up by the police, 90.2 percent reported having been convicted, and 76.5 percent reported having been incarcerated (Table 5). Furthermore 56.5 percent of the heroin group were in some active legal status—either probation, parole, awaiting trial, and/or mental commitment. Only 6 percent of this cohort reported no illegal activity.

The proportions in table 5 appear as rankings in table 6. Continuing with the same example, heroin users, when compared with the other user groups, rank fourth in terms of "ever picked up," while illegal methadone users ranked highest in the proportion "ever picked up." The other four categories in table 5—criminal justice system contacts by age 17, present legal status, convictions, and no illegal activity—are similarly ranked in table 6.

Table 7 begins by accumulating the table 6 rankings into summary form. Heroin users, for example, show a total of 10 in the "ever" category—a sum based on the ranks of 4, 2, 2, 2 from table 6. The "sum of totals" (line A) of 61 for heroin users is then the sum of all the totals (10 for "ever," 20 for "by age 17," etc.). In the second segment of table 7, the previous sums ("ever," "by age 17," "status," etc.) are ranked for each user group. Thus, the heroin users' sum of 10 for "ever" ranks third (after illegal methadone and cocaine) and as such, is designated the rank of 3 in this second segment of the table. These rankings are again summed, giving heroin users a value of 17.5 in the "sum of total rankings" (line B). The final rankings of sums are based on lines A and B, with C representing the combination of lines A and B for each user group.

The "final score" is the line A sum plus the line B sum, after the line B sum was multiplied by 3 for the purposes of giving it the same general numerical range as the line A sum. This "final score" suggests the relative likelihood of criminal involvement of the 11 user groups, with inhalant users designated as highest (score = 94) and alcohol users as lowest (score = 309).

REFERENCES

Anslinger, H. J. Relationship between addiction to narcotic drugs and crime. *Bulletin on Narcotics*, April-June, 1951.

Asbury, H. *The Barbary Coast: An Informal History of the San Francisco Underworld*. Garden City, N.Y.: Garden City Publishing Co., 1933.

Austin, G. A., and Lettieri, D. J., eds. *Drugs and Crime: The Relationship of Drug Use and Concomitant Criminal Behavior*. Rockville, Md.: National Institute on Drug Abuse, 1976.

Ball, J. C., and Lau, M. P. The Chinese narcotic in the United States. *Social Forces*, September, 1966.

Bean, W. *California: An Interpretive History*. New York: McGraw-Hill, 1968.

Bode, William. *Lights and Shadows of Chinatown*. San Francisco: H. S. Crocker, 1896.

Brill, L., and Lieberman, B. *Authority and Addiction*. Boston: Little and Brown, 1970.

Buel, J. W. *Sunlight and Shadow of America's Great Cities*. Philadelphia: West Philadelphia Publishing Co., 1891.

Byrnes, T. *Professional Criminals of America*. New York: G. W. Dillingham, 1886.

Carson, G. *One for a Man, Two for a Horse*. New York: Bramhall House, 1961.

Chambers, C. D. Narcotics addiction and crime: an empirical review. In: Inciardi, J. A., and Chambers, C. D., eds. *Drugs and the Criminal Justice System*. Beverly Hills: Sage, 1974.

Chambers, C. D.; Cuskey, W. R.; and Moffett, A. D. Demographic factors in opiate addiction among Mexican Americans. *Public Health Report*, 85: 523-531, 1970.

Chicago Police Department. *1951 Annual Report*. Chicago: the Department, 1952.

Consumer Reports. *The Medicine Show*. Mount Vernon, New York: Consumers Union, 1971.

Council on Mental Health, American Medical Association. Report on Narcotic Addiction. *Journal of the American Medical Association*, 7:1-834, 1957.

Crapsey, E. *The Nether Side of New York*. New York: Sheldon, 1872.

Dai, B. *Opium Addiction in Chicago*. Shanghai: The Commercial Press, 1937.

DeFleur, L. B.; Ball, J. C.; and Snarr, R. W. The long-term social correlates of opiate addiction. *Social Problems*, Fall 1969. p. 288.

DiCyan, E. and Hessman, L. *Without Prescription*. New York: Simon and Schuster, 1972.

Gong, E Y., and Grant, B. *Tong War*. New York: N. L. Brown, 1930.

Gould, L. C. Crime and the addict: beyond common sense. In: Inciardi, J. A., and Chambers, C. D., eds. *Drugs and the Criminal Justice System*. Beverly Hills: Sage, 1974.

Greenberg, S. W., and Adler, F. Crime and addiction: an empirical analysis of the literature, 1920-1973. *Contemporary Drug Problems*, 3:221-270, 1974.

Inciardi, J. A. *Careers in Crime*. Chicago: Rand McNally, 1975.

______. "In Search of the Class Cannon: A Field Study of Professional Pickpockets." In: *Street Ethnography: Selected Studies of Crime and Drug Use in Natural Settings*, Robert S. Weppner, ed. Beverly Hills, Sage, 1977. pp. 55-77.

______. The villification of euphoria: Some perspectives on an elusive issue. *Addictive Diseases*, 3:241-267, 1974.

Inciardi, J. A., and Chambers, C. D. Unreported criminal involvement of narcotic addicts. *Journal of Drug Issues*, Spring, 1972. pp. 57-64.

Inciardi, J. A.; McBride, D. C.; Russe, B. R.; Wells, K. S.; Pottieger, A. E.; and Siegal, H. A. *Acute Drug Reactions in a Hospital Emergency Room*. Rockville, Md.: National Institute on Drug Abuse, in press.

Kavaler, F. A commentary and annotated bibliography on the relationship between narcotics addiction and criminality. *Municipal Reference Library Notes*, April, 1968. pp. 45-63.

King, R. *The Drug Hang-Up*. New York: Norton, 1972.

Kolb, L. *Drug Addiction: A Medical Problem*. Springfield, Ill.: C C Thomas, 1962.

Kolb, L. Drug addiction and its relationship to crime. *Mental Hygiene*, 9:74-89, Jan. 1925.

Lening, G. *The Dark Side of New York Life and Its Criminal Classes*. New York: Gerhard, 1873.

Lindesmith, A. R. Dope fiend mythology. *Journal of Criminal Law and Criminology*. July-August, 1940. pp. 199-208.

Mauer, D. W. *Whiz Mob: A Correlation of the Technical Argot of Pick-Pockets with their Behavior Pattern*. New Haven, Conn.: College University Press, 1964.

Musto, D. F. *Narcotics and America*. New Haven, Conn.: Yale University Press, 1972.

National Institute on Drug Abuse. *National Drug/Alcohol Collaborative Project: Issues in Multiple*

Substance Abuse, Gardner, S. E., ed. DHEW Pub. No. (ADM)80-957. Washington, D.C.: Supt. of Docs., U.S. Govt. Print. Off., 1980.

O'Donnell, J. A. Narcotic addiction and crime. *Social Problems,* Spring, 1966. p. 376.

Pescor, M. J. A statistical analysis of the clinical records of hospitalized drug addicts. *Public Health Report,* Supp. No. 143, 1943. p. 43.

Plair, W., and Jackson, L. *Narcotic Use and Crime: A Report on Interviews with 50 Addicts Under Treatment.* Washington, D.C.: Department of Corrections, 1973.

President's Commission on Law Enforcement and Administration of Justice. *Task Force Report: Narcotics and Drug Abuse.* Washington, D. C.: U.S. Government Printing Office, 1967.

Research Triangle Institute. *Drug Use and Crime: Report of the Panel on Drug Use and Criminal Behavior.* Springfield, Va.: National Technical Information Service, 1976.

Schur, Edwin M. *Narcotic Addiction in Britain and America.* Bloomington: Indiana University Press, 1962.

Soule, F.; Gilran, J. H.; and Nisbet, J. *The Annals of San Francisco.* New York: Appleton, 1855.

Stanton, J. M. Lawbreaking and drug dependence. Albany, N.Y.: Bureau of Research and Statistics, New York State Division of Parole, 1969.

State of New York Joint Legislative Committee. Legislative Document, Report No. 7. New York: the Committee, 1972.

Sutherland, E. H. *The Professional Thief.* Chicago: University of Chicago Press, 1937.

Terry, C. E., and Pellens, M. *The Opium Problem.* New York: Bureau of Social Hygiene, 1928.

U.S. Department of Health, Education and Welfare. Narcotic Drug Addiction. Health Monograph No. 2. Washington, D.C.: U.S. Government Printing Office, 1963.

U.S. Treasury Department, Bureau of Narcotics. *Traffic in Opium: Dangerous Drugs for the Year Ended December 31, 1939.* Washington, D.C.: U.S. Government Printing Office, 1940.

Winick, C. Drug addiction and crime. *Current History,* 52:349-354, 1967.

Wood, G. B. *A Treatise on Therapeutics and Pharmacology, or Materia Medica.* Philadelphia: Lippincott, 1856.

BLANK PAGE

Chapter 6

Alcohol and Illicit Drug Use

National Followup Study of Admissions to Drug Abuse Treatments in the DARP During 1969–71

D. Dwayne Simpson
Michael R. Lloyd
Institute of Behavioral Research
Texas Christian University

INTRODUCTION

Alcohol consumption by drug users has become a matter of major concern in the study of drug treatment outcomes. As a legal substance, alcohol apparently fills in occasionally as a convenient substitute for illicit drugs, but it is also believed by some to be a more important substitute as drug use is decreased during and after drug treatment. It also appears to have a place of its own in the pattern of multiple drug use. Alcohol use before admission to drug treatment programs has generally been higher among older drug users and males than other types of clients, but the higher drinking rate among multiple drug users is even more striking (Jackson and Richman 1973; Simpson 1976). Jackson and Richman (1973) also noted that heavy drinking occurs more frequently among long-term addicts and readmissions to drug treatment than among first-time admissions.

The history of drug use among opioid addicts has indicated that in some cases excessive alcohol use preceded the addiction to opioid drugs (Brown et al. 1973; O'Donnell 1964, 1969; Weppner and Agar 1971). Brown et al. (1973) cited evidence suggesting that alcohol use decreased when addicts initiated their opioid use and that subsequent entry into drug treatment (methadone maintenance in most cases) was not accompanied by increased drinking. The absence of a substantial change in drinking habits from pretreatment to the treatment process for methadone maintenance clients has also been supported by other studies (Gorsuch et al. 1976; Simpson 1974). Alcohol and illicit drug use during treatment are positively correlated (Neman and Demaree 1976), however, and alcohol use has been cited as a frequent treatment problem and cause of discharge in methadone maintenance programs (Gearing 1970, 1972).

Long-term followup studies of admissions to the Federal narcotic hospital in Lexington by O'Donnell (1964, 1969) and Vaillant (1970) have indicated that alcohol plays a significant role in the lives of addicts, especially if they were heavy alcohol users before opioid addiction, and an increasing role as they advance in age beyond 35–40 years. These studies were based on addicts admitted to the Lexington Hospital prior to 1960, and the sample clients were relatively old at admission compared to those in more recent treatment programs. Inevitably, the drug abuse treatment system and the types of drug users being treated have changed considerably in the years since these studies were initiated.

The present study is based on followup interview data for a sample of 1969–71 admissions (cohort 1) in the Drug Abuse Reporting Program (DARP) sponsored by Texas Christian University of Fort Worth, Texas. This was a more "contemporary" drug treatment sample than those examined by O'Donnell and by Vaillant and involved a shorter interval between discharge from treatment and followup interview. The time span between DARP treatment admission in 1969–71 and the followup interview in 1975–76 was typically 4 to 6 years, and for most of the sample it included at least 3 years since DARP treatment was terminated. The objective of this investigation is to explore in more detail some of the general findings reported previously by Simpson and Lloyd (1976) in a study based on these same data and concerned with the development of alcohol criterion measures for DARP followup evaluation research.

This study focuses on alcohol use and its relationship to illicit drug use and treatment, and it includes two major sets of analyses. The first set of analyses involves the since-DARP period, from DARP termination up to 2 months before the followup interview. It investigates drug use in relation to post-DARP changes in drinking levels and examines variations in alcohol consumption in relation to drug use and time spent in treatment during the post-DARP years. The second set of analyses focuses on alcohol use at-interview, that is, during the 2 months immediately preceding the followup interview. It explores variations in alcohol consumption associated with drug use and treatment status at the time of interview, along with demographic characteristics and measures of previous alcohol use, drug use, and treatment experience.

Description of the Followup Sample

From the 11,383 admissions to 23 agencies that participated in the DARP between June 1969 and June 1971 (DARP cohort 1), a stratified random sample of 1,853 former clients was selected for the followup study. These individuals were selected from four DARP population groups that had sufficient numbers of clients to be included, namely: methadone maintenance (MM), therapeutic community (TC), outpatient detoxification (DT), and intake only (IO). (For further details on the general design and sample selection for the cohort 1 followup study, see Simpson and Joe 1977.) Overall, 87.6 percent of the total sample of 1,853 were located: 1,423 (76.8 percent) of the total sample were interviewed; 133 (7.2 percent) were deceased; 8 (0.4 percent) were out of the country and not interviewed; and 60 (3.2 percent) refused to be interviewed. The remaining 229 (12.4 percent) could not be located. The total number of completed interviews was 1,423, but for technical reasons (see Simpson and Joe 1977), only 1,409 were included in the current followup study.

Sources of Data

The data in this study were obtained from client reports submitted by DARP treatment agencies from 1969 to 1974 and followup interviews conducted in 1975 and 1976.[1] These data represent four time periods, defined as follows:

1. *Before-DARP* refers to the last 2 months before admission to DARP, based on the admission record completed in 1969–71.
2. *During-DARP* refers to time during treatment in the DARP up to 1974, based on bimonthly status evaluation records throughout the first treatment episode in the DARP (for cases of later readmission to the same agency, the later episodes are not reflected in this category).
3. *Since-DARP* refers to time from termination of DARP treatment to 2 months before the followup interview (ranging up to 6 years), based on data obtained by 1-month periods in the activities chart of the followup survey.
4. *At-interview* refers to the last 2 months before followup interview, based on the followup survey completed in 1975–76.

The term "post-DARP," as used throughout this text, is meant to include both the since-DARP and the at-interview time periods.

Measures of Illicit Drug Use

Illicit drug use was reported in categories of 5 to 7 days per week (daily); 1 to 4 days per week (weekly); less than once per week (weekly); and no use at all. These frequencies were recorded separately for each of nine drug classes: heroin, illegal methadone, other opioids, barbiturates, cocaine, amphetamines, hallucinogens, marijuana, and other nonopioids. This information on drug use was collected for each of the four time periods described above; however, drug use information during-DARP included actual number of days of use for each drug class, rather than the general frequency categories used in the before-DARP and post-DARP periods.

---

[1] Checks of internal consistency as well as comparisons of self-report information with criminal justice records of post-DARP incarcerations and treatment reentry records supported the reliability and validity of the data. See Simpson et al. 1976.

The different classes of drugs have been combined in the present study into the categories of *opioid use*, *nonopioid use* (not including marijuana), and *marijuana use*. Each measure reflects the highest frequency of use reported within that particular class of drugs. Opioid use is based on heroin, illegal methadone, and other opioids; and nonopioid use is based on barbiturates, cocaine, amphetamines, hallucinogens, and other nonopioids (other than marijuana). These measures of drug use were defined and examined in more detail by Savage and Simpson (1976).

Measures of Alcohol Use

One of the principal alcohol measures used in the present study is a composite variable, average daily 80-proof liquor equivalent, defined for all four time periods on the basis of the reported consumption of beer, wine, and hard liquor combined. The same measure has been used in previous evaluation research in DARP (Neman and Demaree 1976). The computation involves a transformation of consumption levels for each of the three alcohol beverages to a common unit of measurement; the metric used is 80-proof liquor equivalent, sometimes referred to simply as 80-proof alcohol. For each time period, (1) an average daily rate of beer, wine, and liquor use by an individual was calculated; (2) the amount for each beverage was multiplied by a conversion factor to yield average daily ounces in 80-proof alcohol; and (3) the three scores were then summed to obtain the composite measure. The conversion factors are as follows: Each can (or bottle) of beer was converted to 1.80 ounces of 80-proof alcohol, each pint of wine to 6.50 ounces, and each drink (or shot) of liquor to 1.75 ounces. Because unusually high amounts of 80-proof alcohol were sometimes reported, the procedure recommended by Neman and Demaree (1976) for scaling alcohol use was followed. Thus, the analyses in the present study are based on a four-point index score of average daily 80-proof alcohol use, representing (1) no use, (2) 0.1 to 4.0 ounces, (3) 4.1 to 8.0 ounces, and (4) over 8.0 ounces.

Another alcohol-related variable obtained for all four time periods is *alcohol problems*, referring client-reported incidents of medical, legal, job, or family problems due to the excessive use of alcohol. In contrast to most of the alcohol and drug use variables used in this study, the before-DARP measure of alcohol problems refers to lifetime history, rather than to just the last 2 months before DARP admission.

A composite measure of alcohol consumption across each of the four time periods is the average daily use of 80-proof liquor equivalent described above. This is a frequently used and readily understood measure, but there are some instances in which useful information concerning alcohol use may be overlooked when using it. Particular reference is made to the potential for discriminating between light but frequent drinkers and heavy but relatively infrequent drinkers. The followup information obtained for the at-interview period provided a basis for further analysis by means of a measure that combines this information. This measure was referred to as the *level of alcohol use* and was defined in part by average daily alcohol use, but also recognized the heavy episodic drinker in a classification scheme similar to that used earlier by Cahalan et al. (1969). Four levels of alcohol consumption at-interview were defined as follows:

- *Abstainers*. Persons in this category did not drink in the last 2 months before the followup interview.
- *Light drinkers*. This level includes individuals who had at least one drink in the 2 months previous to interview, but whose average consumption levels on days used did not exceed two cans of beer, 1 pint of wine, or two drinks of liquor, and whose average daily 80-proof liquor equivalent for total alcohol use was not more than 4.0 ounces.
- *Moderate drinkers*. Persons in this category averaged up to 8.0 ounces of 80-proof liquor equivalent per day during the last 2 months, but with infrequent (less than weekly) excessive drinking of any beverage. (Excessive amounts were defined as over six cans of beer, 2 or more pints of wine, or over two drinks of liquor on drinking days.)
- *Heavy drinkers*. Persons so classified consumed excessive amounts of one or more alcoholic beverages on an average of at least once a week and usually averaged over 8.0 ounces of 80-proof

liquor equivalent per day during the 2 months previous to interview.

Each of the alcohol measures used in the present study has been defined and examined in more detail by Simpson and Lloyd (1976).

SINCE-DARP ALCOHOL AND DRUG USE

It was reported in a previous study by Simpson and Lloyd (1976) that alcohol use by the DARP cohort 1 followup sample, as recalled retrospectively in the followup interview, tended to remain stable over time after DARP treatment. Approximately 14 percent of the sample abstained from alcohol use, but 23 percent of all persons interviewed drank an average of *over 8 ounces* of 80-proof liquor equivalent per day during the since-DARP period. Nevertheless, there were times when drinking levels fluctuated. Periods of a month or longer during which drinking was either much higher or much lower than at-interview were reported by 40 percent of the sample: At least one episode of "more" drinking was reported by 19 percent; "less" drinking (not counting time jailed or otherwise confined) was reported by 12 percent; and both "more" and "less" drinking was reported by an additional 9 percent of the sample.

The reasons given in the followup interview for these drinking changes were varied, but frequently they reflected reactions to life events that involved positive experiences and personal satisfaction or negative experiences and unhappiness. However, one of the three most common reasons given for episodes of more, as well as less, alcohol use since-DARP involved illicit drug use: 15 percent of the episodes of more drinking were remembered as being during a simultaneous drop in illicit drug use, while 22 percent of the episodes of less drinking were reported during times of increased illicit drug use. The type of illicit drug referred to was not specified. To verify these simultaneous changes in alcohol and drug use and to examine the types of illicit drugs involved in the apparent alcohol-drug use substitution reported, these data were analyzed in more detail.

Drug Use Before and After a Change in Drinking Habits

The measures of opioid use, nonopioid use, and marijuana use were compared for the 2 months immediately before and for the 2 months after a reported change in alcohol use during the since-DARP period whenever drug use was given as the reason for the change. Separate comparisons (using paired sample T tests) were made for episodes involving more and less drinking, and the comparisons were restricted to only those persons with data in both of the 2 months before and after the drinking change occurred. When the drinking change was to *more* alcohol, means for all three measures of *illicit drug use decreased* from before to after the change, although only the difference for opioid use was statistically significant ($T = 3.89$, $df = 24$, $p = .001$). When the drinking change was to *less* alcohol, means for all three measures of *illicit drug use increased* from before or after the change, but again only the difference for opioid use was statistically significant ($T = -2.35$, $df = 14$, $p = .03$). Thus, the data supported a relationship involving substitutions between alcohol and illicit drug use in this subgroup of the DARP followup sample, but the association with alcohol use primarily involved opioids.

Although these results suggest that alcohol and opioid drugs were used as substitutes for one another on occasion, these data involved only a small portion (less than 10 percent) of the total followup sample. To examine the generalizability of this relationship further, other episodes involving changes to more and less drinking were also considered. These episodes of drinking changes were reported to be for reasons not associated with the patterns of illicit drug use such as life stress and the influence of friends, but might nevertheless have involved a relationship between alcohol and drug use and were therefore examined.

The same types of comparisons described previously were made; they were based on measures of drug use in the 2 months before and after changes to more and to less alcohol use, involving reasons reported which were not related to drug use. These comparisons revealed low levels of use (averaging less than weekly) for each of the three drug use measures before and after a change in alcohol consumption. The differences were near zero and not significant.

The overall results indicated, therefore, that alcohol and illicit drug use post-DARP were interrelated in some instances, but increased or decreased drinking episodes generally were not accompanied by changes in levels of drug use.

Alcohol Consumption During Periods of Drug Use and Treatment

The previous analyses were based only on short segments of time when there were post-DARP changes in alcohol consumption. As already noted, however, such changes in drinking levels involved about 40 percent of the following sample. In order to use more of the information available relevant to alcohol and drug use, a reverse strategy was used in which average level of alcohol consumption since-DARP was analyzed in relation to changes in levels of drug use. The analyses addressed the general issue of whether average daily alcohol use was different during months in which *any* illicit drug use was reported in comparison to months in which *no* drug use was reported.

Procedurally, each of these analyses was conducted in four steps. First, two conditions of drug use were specified for making comparisons of frequency of use. Second, the followup sample was searched for all persons who reported *both* of the specified levels of drug use at some time in the since-DARP period (that is, within-subjects comparisons were made). Third, averages were computed for alcohol use based separately on the months in which each of the two levels of drug use were reported, adjusted for time at risk (that is, only months when the person was not confined in a jail, hospital, or therapeutic community were included in the computations). Finally, the measures of alcohol consumption during the different conditions of drug use were compared using paired sample T tests.

Based on the subsamples with appropriate data, comparisons of alcohol consumption were made for intervals of any illicit drug use versus no illicit drug use ($n = 810$), daily opioid use versus less-than-daily or no opioid use ($n = 582$), and any marijuana use versus no marijuana use ($n = 441$). None of the results for these three tests was statistically significant, although the differences associated with marijuana use approached significance ($T = 1.76$, $df = 440$, $p = .079$); alcohol consumption was slightly higher during periods of marijuana use.[2] The general relationship between drug and alcohol use suggested by these findings was therefore low. Additional analyses of clients' alcohol use during months in outpatient drug treatment compared to months while not in treatment ($n = 594$) also resulted in no significant differences.

It is important to note that these comparisons were based only on subsamples of individuals who used drugs or were in treatment at some time since-DARP; members of the sample who never used drugs at the specified levels or who used continually at those levels were excluded, as were persons who were either not in treatment at any time or continually in treatment. As a result of the exclusions, none of the preceding analyses were based on more than 57 percent of the total followup sample. The data suggest, nevertheless, that among these subsamples reporting some fluctuation in post-DARP drug use and in outpatient drug treatment status, alcohol consumption generally did not change significantly in relation to either of these factors.

ALCOHOL CONSUMPTION BY PERSONS IN DRUG TREATMENT VERSUS NOT IN DRUG TREATMENT POST-DARP

In a previous study based on the present followup data, Simpson and Lloyd (1976) found that alcohol consumption was lower for persons in drug treatment than for those not in treatment at-interview. Because of the emphasis on development of alcohol criterion measures in that study, this particular relationship was not analyzed in detail. The relation of treatment status to alcohol use is important, however, especially in view of the results presented above, which show that alcohol use by persons spending post-DARP time "in and out" of drug treatment generally was not associated with treatment status.

Further study of the relationship between alcohol use and drug treatment was therefore pursued. First, *all* persons in the followup sample were categorized according to whether or not they had any post-DARP treatment, and a comparison was then made of average daily use of 80-proof alcohol, adjusted for time at risk. (Alcohol consumption in previous time periods is discussed later.) These results revealed significant group differences ($T = 2.44$, $df = 1{,}272$, $p = .015$), indicating that persons who never reentered drug treatment after DARP reported higher average daily use of alcohol than those who did (approximately 61 percent of the sample had post-DARP treatment). Comparable analyses conducted separately for each of the first three years of the since-DARP period showed similar results; the differences for the first year after DARP were just short of statistical significance ($p < .079$), but those for both the second and third years were highly significant ($p < .01$).[3] These additional findings are generally consistent with those reported by Simpson and Lloyd (1976) for the at interview period.

---

[2] A similar comparison of alcohol use during months of any employment versus no employment since-DARP ($n = 948$) also resulted in statistically insignificant differences.

The importance of these results is that in the analyses restricted only to persons who moved in and out of post-DARP drug use and treatment, alcohol use showed no significant relationship to treatment status or illicit drug use. On the other hand, when the *total* followup sample was examined, entry into post-DARP outpatient drug treatment was significantly associated with a comparatively *lower* rate of alcohol use. The use of marijuana and of other nonopioid drugs was also found to be associated with post-DARP alcohol consumption; between-subject comparisons of drinking rates by users versus nonusers of marijuana and of other nonopioids during each of the first 3 years since-DARP showed the nonusers drank significantly less alcohol ($p < .01$). No differences were found between opioid users versus nonusers in terms of alcohol consumption. Thus, post-DARP nonopioid drug users and persons with no post-DARP drug treatment tended to be heavier drinkers than their counterparts. These relationships in the at-interview data are analyzed in more detail in the next section, taking into account demographic classification as well as previous drug use and DARP treatment experience.

ALCOHOL AND DRUG USE AT FOLLOWUP INTERVIEW

As in the case of the since-DARP analyses, the alcohol and drug use data for the at-interview period took into account confinement and treatment status of the sample because of the obvious limitations on consumption imposed by full-time stays in residential and institutional settings. The final interviewed sample of 1,409 was therefore divided into five groups according to status at-interview:

- *In alcohol treatment*—34 persons (2 percent of the sample) who were in outpatient alcohol treatment at the time of the interview.
- *In outpatient methadone maintenance (MM)*—317 persons (23 percent of the sample) who were in outpatient methadone maintenance drug treatment at the time of the interview.
- *In outpatient drug free (DF)*—57 persons (4 percent of the sample) who at the time of the interview were in outpatient drug treatment in which they did not receive any maintenance drug.
- *Not in treatment*—772 persons (55 percent of the sample) who were not confined or receiving any drug or alcohol treatment at the time of the interview.
- *Confined*—229 persons (16 percent of the sample) who spent most of the 2 months prior to the interview in a hospital, jail, or therapeutic community.

Table 1 presents the distributions of these five groups by age, sex, ethnic groups, before-DARP drug use, DARP treatment type, days in DARP treatment, and reason for DARP termination. Chi-squares for each variable are shown in the right hand column of the table; for every variable, there were statistically significant differences ($p < .001$) between the groups defined by status at-interview.

Several notable differences stand out between these groups. Compared to the distributions based on all groups combined (total), the alcohol treatment group was older, included more blacks, and was more likely to have quit DARP treatment. Persons in MM and DF were more likely than other groups to have been MM clients in DARP and to have used opioids daily before-DARP. With respect to the reason for DARP termination, a relatively high percentage of the not-in-treatment group completed DARP treatment (20 percent) and a relatively high percentage of the confined group were terminated from DARP treatment because of being incarcerated in jail (11 percent). In addition, the confined group was composed almost entirely of males and included a relatively high percentage of Mexican Americans.

---

[3] Additional analyses of these data for each of the first 3 years post-DARP indicated that alcohol use was the lowest for persons continually in treatment throughout the year, and highest for those never in treatment and for those who reported some time in as well as some time out of treatment during the year.

TABLE 1.—*Confinement and treatment status of followup sample by age, sex, ethnic group, and DARP treatment and tenure*

	Status at interview						
Characteristics	Alcohol treatment	Outpatient drug treatment		Not in treatment	Confined[1]	Total	$\chi^2(df)$
		MM	DF				
			Age at interview, in percent				
Under 23	3	4	12	8	9	8	
23–25	3	16	19	21	20	19	40.9^2
26–30	29	28	27	31	33	30	(20)
31–35	24	23	19	15	20	18	
36–40	15	13	12	13	9	12	
Over 40	26	16	11	12	9	13	
Total	100	100	100	100	100	100	
			Sex, in percent				
Male	82	85	84	88	97	88	24.9^2
Female	18	15	16	12	3	12	(4)
Total	100	100	100	100	100	100	
			Ethnic group, in percent				
Black	65	42	54	47	51	47	
Puerto Rican	3	5	9	4	3	4	42.5^2
Mexican American	6	7	5	5	14	7	(12)
White	26	46	32	44	32	42	
Total	100	100	100	100	100	100	
			Before-DARP drug case, in percent				
Daily opioids only	29	40	26	35	36	36	
Daily opioids plus	47	45	55	37	43	41	40.5^2
Less-than-daily opioids	12	8	7	16	10	12	(16)
Nonopioids only	9	3	7	7	4	6	
Other	3	4	5	5	7	5	
Total	100	100	100	100	100	100	
			DARP treatment, in percent				
Methadone maintenance (MM)	59	70	74	53	53	58	
Therapeutic community (TC)	32	16	17	33	32	29	48.0^2
Outpatient detoxication (DT)	6	7	7	8	7	7	(12)
Intake only (IO)	3	7	2	6	8	6	
Total	100	100	100	100	100	100	
			Days in DARP treatment, in percent				
None	3	7	2	5	8	6	
1–90 days	27	18	17	25	31	24	28.5^2
91–360 days	38	37	51	34	35	36	(16)
361–720 days	18	23	16	23	16	21	
Over 720 days	14	15	14	13	10	13	
Total	100	100	100	100	100	100	
			Reason for DARP termination, in percent				
Quit	79	62	60	58	62	61	
Expelled	3	9	14	9	10	9	84.9^2
Jailed	3	5	5	3	11	5	(20)
Other	0	1	5	1	4	2	
Completed treatment	6	10	4	20	7	14	
Referred	9	13	12	9	6	9	
Total	100	100	100	100	100	100	
			Sample size				
No. in group	34	317	57	772	229	1409	
Percent of total	2	23	4	55	16	100	

[1] Most of these individuals were in a jail or prison during most of the 2 months before interview.

[2] p less than .001.

TABLE 2.—*Frequency distributions and mean scores of alcohol and drug use, at interview, by treatment status at interview*

	Treatment status at interview					
Categories of use	Alcohol treatment	Outpatient drug treatment MM	Outpatient drug treatment DF	Not in treatment	Total	χ^2 (df)
	Average daily 80-proof liquor equivalent, in percent					
No use	29	22	19	10	14	
0.1–4.0 oz.	9	51	44	54	51	75.3[1]
4.1–8.0 oz.	12	11	25	17	16	(9)
Over 8.0 oz.	50	16	12	19	19	
Total	100	100	100	100	100	
Mean score	2.82	2.20	2.30	2.45	2.39	
	Alcohol use level, in percent					
Abstainer	29	22	19	10	14	
Light	0	27	21	26	25	61.8[1]
Moderate	15	29	37	35	33	(9)
Heavy	56	22	23	29	28	
Total	100	100	100	100	100	
Mean score	2.97	2.51	2.63	2.83	2.74	
	Opioid use, in percent					
No use	79	64	68	82	76	
Less than weekly	12	16	12	9	11	45.4[1]
Weekly	3	9	9	5	6	(9)
Daily	6	11	11	4	7	
Total	100	100	100	100	100	
Mean score	1.35	1.68	1.61	1.32	1.44	
	Nonopioid use, in percent[2]					
No use	82	71	84	80	78	
Less than weekly	3	17	7	14	14	25.9[1]
Weekly	15	8	5	5	6	(9)
Daily	0	4	4	1	2	
Total	100	100	100	100	100	
Mean score	1.32	1.45	1.28	1.28	1.33	
	Marijuana use, in percent					
No use	62	42	32	44	43	
Less than weekly	9	22	21	17	18	15.1[1]
Weekly	12	20	30	23	23	(9)
Daily	17	16	17	16	16	
Total	100	100	100	100	100	
Mean score	1.85	2.10	2.33	2.12	2.12	
	Number in sample					
	34	317	57	772	1,180	

[1] *p* less than .001.

[2] Excludes marijuana.

Alcohol and Drug Use by Treatment Status

Measures of alcohol and drug use at-interview are presented by treatment status groups in table 2. The table shows percentage distributions of the four treatment status groups by levels of alcohol and drug use, as well as mean scores for each variable (based on the index scores of 1 to 4 that precede each category in the table). Because they were not considered at risk to use alcohol and drugs as were the other groups, the confined group was excluded from these distributions. Chi-squares based on the distributions of the alcohol and drug use measures for the four treatment groups are presented in the right-hand column of table 2.

Alcohol consumption is presented in terms of indices of average daily 80-proof liquor equivalent and level of use in the first two sections of the table; the results were similar for both measures. The chi-squares indicate that the group differences in alcohol use were significant. The MM Drug Treatment group had the lowest use and the alcohol treatment group had the highest use. Although over half of the alcohol treatment groups was included in the heaviest category of alcohol use, 29 percent were abstainers. Thus, some individuals were apparently controlling drinking while in alcohol treatment, and others were not.

Illicit drug use is reported in terms of opioid use, nonopioid use, and marijuana use in the lower sections of table 2. The chi-squares indicate significant differences between treatment groups for opioid and nonopioid drugs, but not for marijuana. For both opioid and nonopioid drug use, the MM group had the highest use and the not-in-treatment group had the lowest (the DF Drug Treatment group also reported low use of nonopioid drugs).[4]

Table 2 thus indicates that treatment status at-interview was clearly associated with the use of alcohol as well as illicit drugs. Most of the persons in the alcohol treatment group were heavy drinkers, but their use of other drugs was relatively low. As noted previously, this group tended to be older than the others and included a higher percentage of blacks. It was also a small group ($n = 34$), however, and the type and duration of their alcohol treatment were not recorded in the followup interview. The alcohol and drug use of the rather small group in DF drug treatment ($n = 57$) was generally similar to that of the MM Drug Treatment group. The two largest groups (MM Drug Treatment and not in treatment) showed some interesting differences, and both included samples which were large enough to be examined in greater detail.

TABLE 3.—*Summary tables for analysis of variance on average daily use of 80-proof alcohol at interview*

Source	Degrees of freedom	Mean squares	F ratio
Opioid use:			
Treatment[1]	1	17.78	20.94[2]
Opioid use[3]	3	1.62	1.91
Interaction	3	0.96	1.14
Within cell (error)	1,081		
Nonopioid use:			
Treatment[1]	1	17.94	21.56[2]
Nonopioid use[3]	2	10.43	12.53[2]
Interaction	2	1.58	1.89
Within cell (error)	1,083	0.83	
Marijuana use:			
Treatment[1]	1	15.38	18.95[2]
Marijuana[3]	3	14.57	17.96[2]
Interaction	3	1.39	1.71
Within cell (error)	1,081	0.81	
Combined drug use:			
Treatment[1]	1	19.20	23.37[2]
Combined drug use[3,4]	5	8.62	10.49[2]
Interaction	5	1.04	1.27
Within cell (error)	1,077	0.82	

[1] Treatment is a dichotomous variable distinguishing between not in treatment and in methadone maintenance.

[2] $p < .001$

[3] Drug use refers to frequency of use and is scaled as follows: No use = 1; less than weekly = 2; weekly = 3; daily = 4.

[4] Combined drug use consists of the following categories: no use, marijuana only, other nonopioids only, less than daily opioids (with or without other drugs), and daily opioids (with or without other drugs).

Note: These analyses were based on the Classic Experimental Approach solution available in the *Statistical Package for the Social Sciences* (Nie et al. 1975).

Differences Between Not in Treatment and MM Drug Treatment Groups

In analyses reported above, measures of alcohol and drug use were considered separately for groups defined by treatment status at interview. The present analysis examines the joint relationships among the three variables by a series of two-way analyses of variance (ANOVAs) in which alcohol consumption is the dependent variable, and treatment status and illicit drug use are the independent variables. Four ANOVAs were computed using average daily 80-proof alcohol use as the alcohol measure.[5] These are summarized in table 3. In each ANOVA, the first factor was Treatment (not in treatment versus MM drug treatment) and the second factor included opioid use, nonopioid use, marijuana use, and combined drug use, respectively.

Table 3 shows that the main effects for treatment were highly significant, reflecting higher alcohol use by persons in the not-in-treatment group, as observed previously. The associations between frequency of drug use and alcohol consumption represented by the main effects for the second factor are also interesting. The ANOVA including opioid use (first section of the table) reveals that frequency of use for opioid drugs was not significantly related to alcohol consumption. For nonopioid use, the main effects were statistically significant; examination of the group means showed that infrequent (less than weekly) nonopioid users were the heaviest drinkers, compared to the nonusers as well as the most frequent users (weekly or daily).[6] Significant main effects were also found for marijuana use, to the effect that drinking amounts increased with more frequent use of marijuana. None of the three ANOVAs for the drug use measures, however, revealed significant interactions between treatment status and drug use frequency. That is, alcohol consumption at-interview was not differentially related to drug use as a function of whether or not the person was in drug treatment.

---

[4] One-way analyses of variance on mean scores for alcohol and drug use by the four treatment groups were also completed; the results were the same as for the chi-squares and therefore are not reported.

[5] Level of use was subjected to the same analyses, but the results were exactly the same as for 80-proof alcohol and are therefore not reported.

The fourth ANOVA in table 3 includes a variable referred to as "combined drug use" (see Savage and Simpson 1976). It is defined on the basis of combinations of opioid, nonopioid, and marijuana use at-interview and includes no use, marijuana only, other nonopioids only, less-than-daily opioids (with or without other drugs), and daily opioids (with or without other drugs). The analysis for this variable resulted in significant main effects, but as in the other ANOVAs the interaction was not statistically significant. Comparison of the group means indicated that the marijuana only and other nonopioids only categories included the heaviest drinkers.[7]

The analyses confirmed the differences noted in alcohol use according to drug treatment status at-interview, but they also identified marijuana and other nonopioid drug use at-interview as the drug use patterns that were significantly associated with drinking. However, since there are obviously many factors not included in these analyses, such as age, drug use history, type of DARP treatment, etc. that could have an influence on the interpretations of these findings, another linear model analysis was carried out as described below. In this further analysis, statistical control was provided for some of these other factors before addressing the relationships of drug use and treatment with drinking at-interview.

REGRESSION ANALYSIS USING BACKGROUND VARIABLES

A large number of background and followup variables were available for analysis, but in selecting the variable to be included, careful account was taken of the specific ways in which the stratified sampling design of the followup study (Simpson and Joe 1977) affected certain classification variables. For example, sex and ethnic groups were not fully represented in all DARP treatments included in the followup study. Further, some variables, such as the during-DARP criterion measures, were not appropriate for certain subsamples, such as the DARP TC and IO treatment groups. These considerations made it clear that a single comprehensive analysis, including all possible predictor variables, would be inappropriate and that the procedure indicated was to employ a series of more focused analyses. These analyses involved a modified hierarchical procedure for multiple regression (Nie et al. 1975) and were based on alcohol use at-interview (as the criterion variable) by persons in the not-in-treatment and MM drug treatment groups combined. The predictor variables included subsets of demographic, before-DARP, during-DARP, since-DARP, and at-interview measures, which were examined in an ordered sequence.

The results of the first set of analyses are presented in table 4. These are based on the sample of 821 black and white males from all four of the DARP treatment groups included in the followup sample (MM, TC, DT, and IO). The table shows the zero-order correlations between predictor and criterion variables and also the multiple correlations with the criterion of significant predictor variables ($p < .05$) that were identified and incorporated in the linear prediction equation. The results for the two alcohol consumption measures were very similar; the multiple correlation was .35 for the measure based on 80-proof alcohol and .31 for level of use. The importance of these findings is that the relationships noted previously of drug use (marijuana and other nonopioids) and treatment with drinking at-interview were statistically significant even after removing the effects of the other factors included in the table. Except for before-DARP alcohol use and since-DARP alcohol problems, almost all of the other variables considered were not significantly related to alcohol use at-interview.[8]

The results of the second set of analyses are presented in table 5, based on 435 black, Mexican-American, white, and Puerto Rican males in the DARP MM treatment group. This treatment sample allowed the inclusion of during-DARP alcohol and drug use measures as predictor variables. As the table shows, however, alcohol use was the only significant during-DARP predictor identified. Other than the indication of heavier drinking among Mexican Americans, the results were generally comparable to those observed in table 4. That is, the measures of alcohol use and problems for time periods before the followup interview were the principal variables associated with drinking at-interview. After taking these variables into account, the relationships of status in drug treatment and marijuana use (but not other nonopioid use) with drinking at-interview were still significant. The multiple correlations of all predictors with the criterion measures were .42 for 80-proof alcohol and .40 for level of use.

---

[6] In contrast to the analyses of opioid use and marijuana use, the analysis for nonopioid use required that the two highest frequency-of-use categories (weekly and daily) be combined into one because of the low prevalence of each.

[7] The same set of analyses conducted separately for beer, wine, and hard liquor generally revealed the same results.

[8] A similar analysis based on alcohol problems in the at-interview period was also conducted, but the highly skewed distribution of this measure (only 8 percent of the sample reported one or more problems) limited the use of these results.

A third set of analyses was performed involving these same variables based on black and white males and females in DARP MM. Males were found to be heavier drinkers than females, but the results in general were unchanged from those in table 5 and therefore are not presented.

Alcohol Consumption in Previous Time Periods

The preceding analyses have indicated that drinking tended to be heavier at-interview in the not-in-treatment group than in the MM drug treatment group, even after various background factors were taken into account. Drinking habits in previous time periods were found to be associated with drinking at-interview, but the results stopped short of answering another important question—namely, whether alcohol use by these same two groups of individuals also differed in any previous time periods. Comparisons of 80-proof alcohol measures for these persons during the before-DARP, during-DARP, and since-DARP periods revealed no significant differences. Thus, variations in amount of drinking at-interview between these groups appeared to be directly related to current drug treatment status, since the differences observed did not exist in earlier periods.

TABLE 4.—*Summary of hierarchical regression analyses of alcohol use at interview for all DARP treatment groups*[1]

Predictor variables	Average daily 80-proof liquor equivalent		Level of alcohol use	
	r[2]	R[3]	r[2]	R[3]
Demographic:				
Age at interview	−.04	—	−.06	—
Black	.01	—	−.01	—
Before DARP:				
Opioid use	−.04	—	−.05	—
Nonopioid use	.07	—	.03	—
Marijuana use	.07	.07	.06	—
Alcohol use	.18	.18	.14	.14
Alcohol problems	.04	—	.02	—
Treatment modality during DARP:				
Methadone maintenance (MM)	−.06	—	−.05	—
Therapeutic community (TC)	.05	—	.04	—
Outpatient detoxification (DT)	.03	—	.03	—
Time in treatment	−.06	—	−.02	—
Since DARP:				
Any drug treatment	−.01	—	−.04	—
Alcohol problems	.20	.26	.17	.22
At interview:				
In drug treatment (MM)	−.13	.28	−.16	.27
Opioid use	.05	—	.00	—
Nonopioid use	.13	.31	.08	.28
Marijuana use	.20	.35	.17	.31
Multiple correlation (r)		.35		.31
Predicted variance (r^2), in percent		12		9
Number of persons		821		821

[1] These analyses are based on black and white males only, since other ethnic groups and females were not represented in all DARP treatment groups; persons confined at-interview (in jail, hospital, or therapeutic community) were also excluded because of their limited access to alcohol.

[2] Zero-order correlation between predictor and criterion variables.

[3] Cumulative multiple correlation coefficients associated with significant predictor variables ($p < .05$).

TABLE 5.—*Summary of hierarchical regression analyses of alcohol use at interview for DARP MM treatment groups*[1]

Predictor variables	Average daily alcohol 80-proof liquor equivalent		Level of alcohol use	
	r[2]	R[3]	r[2]	R[3]
Demographic:				
Age at interview	−.04	—	−.07	—
Ethnic Group				
Black	−.03	—	−.08	—
Mexican-American	.13	.13	.17	.17
White	−.08	—	−.07	—
Before DARP:				
Opioid use	.04	—	.07	—
Nonopioid use	−.01	—	−.04	—
Marijuana use	.11	.18	.05	—
Alcohol use	.24	.29	.18	.26
Alcohol problems	.05	—	.08	—
During DARP:				
Time in treatment	−.01	—	.01	—
Opioid use	−.06	—	−.06	—
Nonopioid use	−.03	—	−.08	—
Marijuana use	.00	—	−.02	—
Alcohol use	.28	.35	.24	.32
Alcohol problems	.12	—	.15	—
Since DARP:				
Any drug treatment	−.07	—	−.09	—
Alcohol problem	.19	.38	.16	.34
At interview:				
In drug treatment (MM)	−.16	.40	−.18	.38
Opioid use	−.01	—	−.07	—
Nonopioid use	.01	—	−.02	—
Marijuana use	.18	.42	.14	.40
Multiple correlation (R)		.42		.40
Predicted variance (R^2)		17%		16%
Number of persons		435		435

[1] These analyses are based on black, Mexican American, white, and Puerto Rican males in DARP MM treatment, but persons confined at-interview (in jail, hospital, or therapeutic community) were excluded because of their limited access to alcohol.

[2] Zero-order correlation between predictor and criterion variables.

[3] Cumulative multiple correlation coefficients associated with significant predictor variables ($p < .05$).

CONCLUSION

The present study was based on followup data on 1,409 persons interviewed 4 to 6 years after admission to drug treatments in the Drug Abuse Reporting Program (DARP). The admissions to DARP occurred in 1969–71, and for most persons the followup data included 3 or more years after termination of DARP treatment. The study focused on variations in alcohol consumption associated with drug use and treatment status for a sample of clients after they left DARP. The major findings were that (1) substitution of use occurred in some instances between alcohol and opioid drugs for a small segment of the sample; (2) persons who returned to drug treatment after DARP generally tended to use less alcohol than persons who did not; and (3) the use of alcohol tended to accompany the use of nonopioid drugs (particularly marijuana), but not opioid drugs.

The evidence suggesting a substitution of use involving alcohol and opioid drugs was limited to a small portion of the total sample (less than 10 percent) and therefore was restricted in its generalizability. The relationship between alcohol use and return to drug treatment after DARP was a more general, but also more complex, finding in the present data. Persons with post-DARP drug treatment (61 percent of the sample) presumably returned to treatment because they continued to have drug problems; this is consistent with the finding that drug use at the time of the followup interview, especially opioid use, was higher for persons in treatment than for those not in treatment. (See

Savage and Simpson 1977, for further analysis of the relationship between drug use and treatment.) Drinking was more prevalent among persons who had no post-DARP treatment than among those who did, but the differences in drinking between these groups were not great; the differences in average consumption rates reflect the fact that the group which did not return to treatment had a somewhat higher proportion of moderate as well as heavy drinkers. In summary, persons who did not return to treatment after DARP termination had lower opioid drug use, but slightly higher alcohol consumption, than those who did reenter treatment. The use of marijuana and other nonopioid drugs also tended to be associated with higher drinking rates.

Although the findings of this study showed that nonopioid (particularly marijuana) users and persons with no drug treatments after DARP tended to be heavier drinkers than their counterparts, it is interesting to note that there was a general lack of "within subject" drinking variations associated with these factors. That is, individuals in the followup study who experienced one or more treatment episodes after DARP and whose levels of drug use fluctuated over this period reported no significant drinking differences related to these treatment reentries or fluctuations in drug use (especially opioid and nonopioid drugs).

Several investigators have found evidence that some opioid addicts had histories of excessive drinking *before* beginning their careers in narcotics use. A chronic need or desire for the psychological effects of drugs by some individuals, whether from alcohol or other drugs, may explain in part the results of the present study. As suggested previously by Jackson and Richman (1973) and Simpson (1976), alcohol can be considered as one of a number of agents involved in multiple drug abuse. Indeed, alcohol use was higher among persons who used nonopioid drugs, particularly marijuana, in the present study. However, it is important to emphasize that the majority of the DARP followup sample, including persons who were treated for drug use after DARP as well as those who were not, cannot be regarded as heavy or excessive alcohol users.

Although excessive drinking may eventually become a problem for some persons following a drug use career and treatment, the present data suggest that its probability is not as great as sometimes expected. Furthermore, it should be noted that drinking and illicit drug use do not occur independently of other life events. This broader context involving substance abuse in conjunction with other behavioral indices is addressed in research now in progress based on the DARP followup data.

REFERENCES

Brown, B. S.; Kozel, N. J.; Meyers, M. B.; and DuPont, R. L. Use of alcohol by addict and non-addict populations. *American Journal of Psychiatry,* 130(5) :599-601, 1973.

Cahalan, D.; Cisin, I. H.; and Crossley, H. M. *American Drinking Practices: A National Study of Drinking Behavior and Attitudes* Monograph No. 6. New Brunswick, N. J.: Rutgers Center of Alcohol Studies, 1969.

Gearing, F. R. Evaluation of methadone maintenance treatment programs. *International Journal of the Addictions,* 5(3):517-543, 1970.

Gearing, F. R. Methadone Maintenance: Six Years Later. *Contemporary Drug Problems,* 1(2): 191-206, 1972.

Gorsuch, R. L.; Butler, M. C.; and Sells, S. B. Evaluation of treatments for drug users in the DARP: 1972-1973 admissions. In: Sells, S. B., and Simpson, D. D., eds. *Effectiveness of Drug Abuse Treatment.*Vol. 5. *Evaluation of Treatment Outcomes for the 1972-73 Admission Cohort,* Cambridge, Mass.: Ballinger, 1976.

Jackson, G. W., and Richman, A. Alcohol use among narcotic addicts. *Alcohol Health and Research World* 1:25-28, 1973.

Neman, J. F., and Demaree, R. G. Behavioral criteria for assessment of outcomes during treatment for drug users in the DARP: 1972-1973 admissions. In: Sells, S. B., and Simpson, D. D., eds. *Effectiveness of Drug Abuse Treatment*(Vol. 5). *Evaluation of Treatment Outcomes for the 1972-73 Admission Cohort.* Cambridge, Mass,: Ballinger, 1976.

Nie, N. H.; Hull, C. H.; Jenkins, J. G.; Steinbrenner, K.; and Bent, D. H. *Statistical Package for the Social Sciences.* New York: McGraw-Hill, 1975.

O'Donnell, J. A. A followup of narcotic addicts: Mortality, Relapse and Abstinence. *American Journal of Orthopsychiatry,* 34:948-954, 1964.

______. *Narcotic Addicts in Kentucky.* Washington, D.C.: U.S. Government Printing Office, 1969.

Savage, L. J., and Simpson, D. D. *Illicit Drug Use and Return to Treatment: National Followup Study of Admissions to Drug Abuse Treatments in the DARP during 1969-1971.* IBR Report 77-3. Fort Worth: Institute of Behavioral Research, Texas Christian University, 1977.

______.*Measures of Illicit Drug Use: National Followup Study of Admissions to Drug Abuse Treatments in the DARP during 1969-1971* IBR Report 76-14. Fort Worth: Institute of Behavioral Research, Texas Christian University, 1976.

Simpson, D. D. Pretreatment Drug Use by Patients Entering Drug Treatment Programs during 1971-1973. *Journal of Drug Education, 6(1):53-71, 1976.* Reprinted in: Sells, S. B., and Simpson, D. D., eds. *Effectiveness of Drug Abuse Treatment* Vol. 3. *Further Studies of Drug Users Treatment Typologies and Assessment of Outcomes During Treatment in the DARP.* Cambridge, Mass.: Ballinger, 1976.

______.Use of alcohol by DARP patients in treatment for drug abuse: 1969-1971 admissions. In: Sells, S. B., and Simpson, D. D., eds. *Effectiveness of Drug Abuse Treatment* Vol. 2. *Research on Patients, Treatments, and Outcomes,* Cambridge, Mass.: Ballinger, 1974.

Simpson, D. D., and Joe, G. W. *Sample Design and Data Collection: National Followup Study of Admissions to Drug Abuse Treatment in the DARP during 1969-1972* IBR Report 77-8. Fort Worth: Institute of Behavioral Research, Texas Christian University, 1977.

Simpson, D. D., and Lloyd, M. R. *Measures of Alcohol Use: National Followup Study of Admissions to Drug Abuse Treatments in the DARP during 1969-1971.* IBR Report 76-12. Fort Worth: Institute of Behavioral Research, Texas Christian University, 1976.

Simpson, D. D.; Lloyd, M. R.; and Gent, M. *Reliability and Validity of Data: National Followup Study of Admissions to Drug Abuse Treatments in the DARP During 1969-1972* IBR Report 76-18. Fort Worth: Institute of Behavioral Research, Texas Christian University, 1976.

Vaillant, G.E. The natural history of narcotic drug addiction. *Seminars in Psychiatry,* 2(4):486-498, 1970.

Weppner, R. and Agar, M. Immediate precursors to heroin addiction. *Journal of Health and Social Behavior,* 12:10-18, 1971.

Chapter 7
Characteristics of Combined Opiate and Alcohol Abusers

Carl D. Chambers, Ph.D.
Personal Development Institute
Miami, Florida

INTRODUCTION

There has been substantial interest in the sequential, concurrent, and interchangeable patterns of alcohol and opiate abuse since the latter half of the 19th century. Epidemiological and clinical references to these phenomena can be found in the professional literature of the 1880s (Goldstein 1973, O'Donnell 1963). In spite of a professional concern which has spanned a hundred years, our demonstrable knowledge is still limited to rudimentary prevalence statements. The prevailing attitude in this country—that alcohol abusers were substantially different from all other types of substance abusers—prevented inquiry focused upon pervasive substance-abusing behavior which includes the intake of both opiates and alcohol. However, recent epidemiological assessments indicating a high prevalence of such combined opiate and alcohol abuse, coupled with clinical determinations of special medical hazards, have pointed to the need for knowledge in this area.

This chapter has been written to provide the reader with descriptive findings regarding those persons who have abused or continue to abuse both alcohol and the opiates. A review of the literature established a knowledge base from which to proceed. The more relevant components of this knowledge base, for immediate purposes, were as follows.

Prevalence estimates of combined alcohol and opiate abuse included references to alcohol abuse (1) before opiate addiction; (2) during opiate addiction; (3) during treatment for opiate addiction; and (4) after treatment. Conclusions, as indicated in table 1, are as follows:

1. Among persons who have histories of combined alcohol/opiate abuse, the abuse of alcohol most frequently precedes the abuse of the opiates. Studies in the literature indicate that 13 to 68 percent of all opiate addicts being treated for their drug habit have histories of alcohol abuse which predate their opiate addiction.
2. The concurrent abuse of both alcohol and opiates appears to involve from 4 to 39 percent of all opiate addicts.
3. The substitutive abuse of alcohol during treatment for opiate addiction appears to involve from 8 to 27 percent of all opiate-addicted patients.
4. The substitutive abuse of alcohol after treatment for opiate addiction appears to involve from 5 to 27 percent of all addict-patients who have terminated treatment.

Unfortunately, the general understanding of what these prevalence numbers really mean is severely

TABLE 1.—*Prevalence estimates of combined alcohol/opiate abuse, in percent*

Reference	Before addiction	Alcohol abuse during addiction	During treatment	After treatment
Babst (1971)	—	4	12	—
Chambers et al. (1970)	13	—	—	—
Chambers and Inciardi (1974)	—	—	—	27
Cohen (1976)	50	33	—	—
Gearing (1970)	—	—	8	—
Goldstein (1973)	17–34	8–17	—	—
Jackson and Richman (1973)	—	27–39	—	—
Kolb (1962)	39	20	—	—
Kreek (1973)	20	—	—	—
Ling et al. (1973)	—	—	17	—
Maddux and Elliott (1975)	—	—	27	—
O'Donnell (1963)	—	—	—	27
O'Donnell (1964)	—	—	—	17
O'Donnell (1969)	57	6	—	5
Richman et al. (1973)	—	10	9	—
Rosen et al. (1975)	68	22	—	—
Sample (1977)	—	7	—	—
Scott et al. (1973)	—	5	27	—
Taintor and D'Amanda (1973)	—	16	—	—
Vaillant (1966)	—	—	—	23

limited as a result of inconsistencies in defining terms, variations in design methodologies, and disparities in study populations. Highly significant is the fact that such assessments have often been conducted and/or reported incidentally to the major focus of a study.

In spite of the obvious limitations to the prevalence estimates in the literature, the various "costs" of combined alcohol and opiate abuse are significant:

- Green and Jaffe (1977) have reviewed the medical literature discussing persons with dual addictions as opposed to those with one, and have found higher mortality rates and increased morbidity, including evidence of more serious liver disease and intensification of electrocardiogram abnormalities. In addition, these reviewers summarized the numerous reports indicating that alcohol consumption frequently plays a role in the death of active narcotic addicts. For example, alcoholism has been cited as a contributing factor in 7 to 64 percent of addict deaths, including deaths resulting from "overdose" (also see S. Cohen, this volume).
- Mezritz et al. (1974) found alcohol consumption clearly presented a greater threat to successful detoxification than did the continued use of opiates. Alcohol consumption showed a threefold increase during detoxification; those who continued heavy involvement after treatment tended to have started having alcohol problems during treatment.
- Chambers and Inciardi (1974), studying a major therapeutic community program, found that alcohol was more associated with posttreatment problems than was heroin.
- Babst et al. (1971), studying methadone maintenance programs, found that drinking during treatment was a significant predictor of client retention in programs. For example, those who drank terminated treatment prematurely.

Recognizing the impact that alcohol consumption has on client health and treatment, this chapter attempts to correct some of the information deficits concerning prevalence estimates and to increase knowledge in areas previously unexplored. The reader will be presented with general descriptions of those persons who abuse both alcohol and opiates on a *regular* basis. Of particular interest to this chapter are data relative to general *patterns* of combined alcohol/opiate use, the *sequences* of such use, and the general *lifestyles* associated with alcohol/opiate users. It was decided that data bases most responsive to these demands would be (1) a diverse and nationally representative sample of substance abusers immediately prior to the treatment experience (NDACP); (2) a smaller, regional sample capable of yielding detailed data on clients in treatment (South Florida residential clients in treatment); and (3) interviews with an at-large, "street" population regularly abusing opiates and alcohol (a randomly selected cohort of active users in five selected Florida cities). Virtually all of the opiate abusers in the three study populations were primarily users of heroin, or heroin addicts who on occasion would also use other opiates.

NATIONAL DRUG/ALCOHOL COLLABORATIVE PROJECT

Clients Interviewed at Intake

As mentioned previously, the NDACP (the National Drug/Alcohol Collaborative Project, described in the introduction to this volume) was chosen for analysis as a nationally representative sample of multiple substance users currently in treatment. As a large-scale data collection effort ($n = 1{,}544$) it provided information on demographics, emotional stability, and living situation, as well as other individual characteristics, by questioning clients during a pretreatment interview. Analysis of NDACP for the first part of this chapter concentrated on these three variables as a result of the following hypotheses:

1. *Demographics.* It was felt that demographic characteristics—particularly age, sex, race, and education—would effectively discriminate between those who regularly abuse both alcohol and opiates and those who do not. Specifically, it was supposed that the former group would be older, have a greater proportion of males, have a greater proportion of blacks, and tend to be less educated. (These tendencies have been supported by previous research in the fields; see Green and Jaffe 1977 and O'Donnell 1969.)
2. *Emotional stability.* Greater emotional instability—as evidenced by records of suicide attempts and prior treatment experiences—was predicted on a subjective basis to be more typical of regular opiate/alcohol users.
3. *Preadolescent living situation.* Although several living situation variables were available, the author concentrated on those which best described the subject's childhood upbringing: father's occupation, mother's occupation, economic level of community, type of community (urban versus rural), and presence of siblings. Assuming—along with most social analysts—that such criteria may be predictors of preadult stability, the author hypothesized that lower status of parental occupation, upbringing in a poorer community and an urban environment, and fewer brothers and sisters would characterize regular opiate/alcohol users. (Green and Jaffe (1977) have found such trends for father's occupation and neighborhood income level.)

Methodology

Within the total NDACP population of 1,544, 625 (40.5 percent) reported the prior use of both alcohol and opiates. Virtually all of these combined substance users preferred heroin as the opiate of choice (99.4 percent). For purposes of this chapter, it was decided to divide the combined user group into two subpopulations for comparison. Classifications and their distributions are as follows:

- Persons who used heroin and alcohol on an irregular basis—352 (56.3 percent)
- Persons who regularly used both heroin and alcohol (i.e., nearly every day for at least a month)—273 (43.7 percent)

It is of interest here to note that progression beyond the irregular use of both heroin and alcohol was quite high. Progression of those who had ever used alcohol to the regular use of it was almost two out of three (62.9 percent). Progression among heroin users was slightly higher (70.9 percent).

Demographic Characteristics

Age

Age was established for each respondent at the time of admission for treatment (see table 2). As predicted, the comparative analysis showed that the regular users of both heroin and alcohol were significantly older than those who used both but not on a regular basis.[1]

Sex

As is commonly seen in other treatment program admissions, men predominate in both sub-

---

[1] A chi-square comparison test of those 25 and under with those over 25 revealed the significance of this difference ($x^2 = 27.69$, $p = < .001$).

TABLE 2.—*Opiate and alcohol use by age, NDACP sample*

Age group	Regular use of both		Irregular use of both		Total users	
	n	Percent	*n*	Percent	*n*	Percent
Less than 16	0	—	6	1.7	6	1.0
16–18	1	0.4	26	7.4	27	4.3
19–21	19	7.0	43	12.2	62	9.9
22–25	62	22.7	100	28.4	162	25.9
Over 25	181	66.3	167	47.4	348	55.7
No data	10	3.6	10	2.8	20	3.2
Total	273	100.0	352	99.9[1]	625	100.0

[1] Percentages do not actually total 100 because of rounding.

TABLE 3.—*Opiate and alcohol use by sex, NDACP sample*

Sex group	Regular use of both		Irregular use of both		Total users	
	n	Percent	*n*	Percent	*n*	Percent
Men	226	82.8	284	80.7	510	81.6
Women	44	16.1	67	19.0	111	17.8
No data	3	1.1	1	0.3	4	0.6
Total	273	100.0	352	100.0	625	100.0

populations (table 3). Quite unexpectedly, however, sex was not seen as a variable distinguishing between *levels* of abuse.

Race

Race was found to be a statistically significant variable distinguishing those who were regular heroin/alcohol abusers from those who did not use heroin and alcohol on a regular basis (table 4). Black involvement in the regular use of both heroin/alcohol *is* significantly greater than among nonblacks.[2]

Education

Education was not found to be a variable which would distinguish between those who regularly abused heroin/alcohol and those who did not, although slightly more irregular users did graduate from high school. (See table 5.)

Emotional Stability Measures

Suicide Attempts

Suicide attempts were prevalent in both groups of heroin/alcohol abusers, as shown in table 6, but such behavior was not found to distinguish between those who used both substances regularly and those who did not.

Prior Treatments for Emotional Problems

Prior treatments for emotional problems were also quite common in both groups of heroin/alcohol abusers (see table 7). While it was expected that this variable would be more typical of those who abused both substances regularly, the direction of this occurrence was unexpected. Prior treatments for emotional problems were significantly greater among those who used *neither* substance regularly than those who did.[3]

Preadolescent Living Situation

As indicated previously, the NDACP data base contains several variables which individually and collectively provide an insight into preadolescent periods for the two study cohorts, i.e., the regular and irregular users of opiates and alcohol. These variables, based on the respondents' lives through age 12, include parental occupation, economic level of community, urban versus rural environment, and presence of siblings. A comparative analysis

---

[2] A chi-square comparison test revealed the significance of this difference (x^2 = 66.13, p = < .001).

[3] A chi-square comparison test revealed the significance of this difference (x^2 = 4.50, p = < .05).

TABLE 4.—*Opiate and alcohol use by race, NDACP sample*

	Regular use of both		Irregular use of both		Total users	
Race group	*n*	Percent	*n*	Percent	*n*	Percent
White	80	29.3	221	62.8	301	48.2
Black	181	66.3	119	33.8	300	48.0
Other	9	3.3	9	2.6	18	2.9
No data	3	1.1	3	0.9	6	0.9
Total	273	100.0	352	100.1[1]	625	100.0

[1] Percentages do not actually total 100 because of rounding.

TABLE 5.—*Opiate and alcohol use by level of education, NDACP sample*

Education group	Regular use of both		Irregular use of both		Total users	
	n	Percent	*n*	Percent	*n*	Percent
Less than high school	169	61.9	199	56.5	368	58.9
High school	70	25.6	92	26.1	162	25.9
Post high school	34	12.5	61	17.3	95	15.2
Total	273	100.0	352	99.9[1]	625	100.0

[1] Percentages actually do not total 100 because of rounding.

TABLE 6.—*Opiate and alcohol use by incidence of suicide attempts, NDACP sample*

	Regular use of both		Irregular use of both		Total users	
Suicide attempts	*n*	Percent	*n*	Percent	*n*	Percent
Yes	44	16.1	67	19.0	111	17.8
No	229	83.9	278	79.0	507	81.1
No data	—	—	7	2.0	7	1.1
Total	273	100.0	352	100.0	625	100.0

TABLE 7.—*Opiate and alcohol use by incidence of prior treatment for emotional problems, NDACP sample*

	Regular use of both		Irregular use of both		Total users	
Prior treatment for emotional problems	*n*	Percent	*n*	Percent	*n*	Percent
Yes	65	23.8	110	31.2	175	28.0
No	208	76.2	239	67.9	447	71.5
No data	—	—	3	0.9	3	0.5
Total	273	100.0	352	100.0	625	100.0

TABLE 8.—*Opiate and alcohol use by parental access, NDACP sample*

Parental access	Regular use of both		Irregular use of both		Total users	
	n	Percent	*n*	Percent	*n*	Percent
Both parents	136	49.8	226	64.2	362	58.0
Mother only	88	32.2	78	22.2	166	26.6
Father only	6	2.2	8	2.3	14	2.2
Other relatives	31	11.4	26	7.4	57	9.1
Stepparents	2	0.7	4	1.1	6	0.9
Others	5	1.9	2	0.6	7	1.1
No data	5	1.8	8	2.3	13	2.1
Total	273	100.0	352	100.1[1]	625	100.0

[1] Percentages do not actually total 100 because of rounding.

TABLE 9.—*Opiate and alcohol use by presence of siblings, in percent, NDACP sample*

Siblings	Use of both heroin/alcohol	
	Regular use ($n = 273$)	Irregular use ($n = 352$)
Yes—brothers	71.1	73.3
Yes—sisters	57.9	63.6
Yes—either or both	94.1	96.6

TABLE 10.—*Opiate and alcohol use by economic level of community, NDACP sample*

Economic level of community	Regular use of both		Irregular use of both		Total users	
	n	Percent	*n*	Percent	*n*	Percent
Low income	167	61.1	139	39.5	306	49.0
Mid income	99	36.3	193	54.8	292	46.7
High income	6	2.2	15	4.3	21	3.3
No data	1	0.4	5	1.4	6	1.0
Total	273	100.0	352	100.0	625	100.0

TABLE 11.—*Opiate and alcohol use by type of community (rural/urban), NDACP sample*

Type of community	Regular use of both		Irregular use of both		Total users	
	n	Percent	*n*	Percent	*n*	Percent
Urban	178	65.2	203	57.7	381	61.0
Suburban	39	14.3	73	20.7	112	18.0
Small town	43	15.7	51	14.5	94	15.0
Rural	13	4.8	21	6.0	34	5.4
No data	—	—	4	1.1	4	0.6
Total	273	100.0	352	100.0	625	100.0

was also made with regard to parenting access during these formative years (table 8), indicating that "broken homes" were prevalent throughout the study group. Those heroin/alcohol abusers who used both substances irregularly often spent their preadolescent years in families where both natural parents were present.[4] Regular users were more frequently raised by their mothers alone than those who did not progress to regular use.[5]

Siblings

Almost all of the study population, regardless of frequency of consumption, had been reared in settings where brothers and sisters were present (table 9). Differences were not statistically significant.

Economic Level of Community

Without question, the nine National Drug/Alcohol Collaborative Project programs serviced populations in which low-income families were overrepresented (see table 10). Based on self-reports of neighborhood descriptions, one of every two patients lived in low income neighborhoods during the formative preadolescent years. Type of neighborhood was found to distinguish between those heroin/alcohol abusers who use both substances regularly and those who do not. Persons who abuse both regularly more often were reared in low income neighborhoods.[6]

Type of Community (Rural/Urban)

The National Drug/Alcohol Collaborative Project programs are primarily located in or adjacent to large metropolitan settings. Consequently, the populations serviced in these programs reflect the locale, with most clients being from urban or suburban settings, as shown in table 11. Controlling for this factor, it was evident that a higher percentage of regular users came from urban areas than did irregular users.

Parental Occupation

The principal occupations for the fathers of these heroin/alcohol abusers were found to be remarkably

---

[4] A chi-square comparison test revealed the significance of this difference (x^2 = 13.93, $p = < .001$).

[5] A chi-square comparison test revealed the significance of this difference (x^2 = 7.86, $p = < .01$).

[6] A chi-square comparison test revealed the significance of this difference (x^2 = 27.77, $p = < .001$).

TABLE 12.—*Opiate and alcohol use by father's occupation, NDACP sample*

Father's occupation	Regular use of both		Irregular use of both		Total users	
	n	Percent	*n*	Percent	*n*	Percent
Professional	20	7.3	33	9.4	53	8.5
Manager	15	5.5	47	13.4	62	9.9
Clerical	5	1.8	10	2.8	15	2.4
Sales	4	1.5	18	5.1	22	3.5
Craftsman	53	19.4	60	17.0	113	18.1
Operative	29	10.6	46	13.1	75	12.0
Service	24	8.8	26	7.4	50	8.0
Laborer	41	15.1	44	12.5	85	13.6
Other	5	1.8	3	0.9	8	1.3
No data	77	28.2	65	18.5	142	22.7
Total	273	100.0	352	100.1[1]	625	100.0

[1] Percentages do not actually total 100 due to rounding.

diverse. (See table 12). Given the respondents' appraisal of the income level of the neighborhoods in which they resided, the distribution was even more unexpected. Assuming a correlation would exist between neighborhood and father's occupation, the expectation that father's occupation would distinguish between levels of use was correct. Persons who did not abuse heroin/alcohol on a regular basis more often had fathers who were specifically professionals/managers and/or generally white collar workers.[7]

As a significant number of the combined regular users of heroin/alcohol reported they were reared by their mothers alone and/or that their mothers were employed outside the home during this preadolescent period, mother's occupations were also compared (table 13). While being reared by one's mother alone was associated with regular use, neither the incidence of her working outside the home nor her specific occupation further elaborated upon this relationship.

Comment

For the most part, the expectations concerning the demographic characteristics of this study group were borne out. Those who regularly abused heroin and alcohol were significantly older and had proportionately more blacks than those who irregularly used both substances. However, education and sex variables did not distinguish between the two cohorts, although men were disproportionately represented in both.

Data from emotional stability measures emerged in an unexpected direction. Suicide attempts were proportionately frequent for all subjects, and prior treatments for emotional problems were, surprisingly, greater for those with irregular use of heroin and alcohol. One explanation for this finding is that individuals more heavily involved in substance abuse may be more prone to overlook or denigrate the rehabilitative opportunities available to them— possibly because of greater identification with the drug-using subculture.

Preadolescent living situations tended to discriminate between levels of abuse in predicted directions. Regular users of heroin/alcohol more frequently came from broken homes, were reared in low-income neighborhoods in urban settings, and had fathers who worked in low-status occupations. Neither the presence of siblings nor the mother's occupational status discriminated between the user groups. It seems reasonable to assume that many of the living conditions mentioned here are experienced by blacks in the major urban settings where the collaborative project was implemented.

TABLE 13.—*Opiate and alcohol use by mother's occupation, incidence of employment, and type of occupation (NDACP sample)*

Mother employed outside home:	Regular use of both		Irregular use of both		Total users	
	n	Percent	*n*	Percent	*n*	Percent
Yes	140	51.3	173	49.1	313	50.1
No	112	41.0	154	43.8	266	42.6
No data	21	7.7	25	7.1	46	7.4
Total	273	100.0	352	100.0	625	100.1[1]
Occupation type:						
Professional	20	14.3	27	15.6	47	15.0
Manager	5	3.6	6	3.5	11	3.5
Clerical	11	7.9	26	15.0	37	11.8
Sales	—	—	7	4.0	7	2.2
Craftsman	9	6.4	8	4.6	17	5.4
Operative	23	16.4	25	14.5	48	15.3
Service	22	15.7	37	21.4	59	18.8
Laborer	17	12.1	10	5.8	27	8.6
Other	33	23.6	27	15.6	60	19.2
Total	140	100.0	173	100.0	313	99.8[1]

[1] Percentages do not actually total 100 due to rounding.

---

[7] A chi-square comparison test revealed the significance of these differences. Respectively the two tests were $x^2 = 6.44$, $p < .02$ and $x^2 = 12.18$, $p = < .001$.

CLIENTS UNDERGOING TREATMENT: SOUTH FLORIDA

In view of the fact that the NDACP analysis was based on intake data, in order to achieve some diversity, the author interviewed a contemporary post-intake treatment population of regular users of opiates with respect to their levels of alcohol consumption. Subjects were obtained from two therapeutic communities and two reentry facilities in South Florida. The data which resulted provided incidental information on demographics, and particularly psychological/physical dependence patterns, preferred patterns of substance abuse, sequence of alcohol/opiate use, and arrest/incarceration data. These variables were used to reflect on the following hypotheses:

1. *Psychological and Physical Dependence*. Taking cognizance of clinical experience with alcoholics, the author hypothesized that addiction to alcohol would more likely be psychological than physical among alcohol/opiate abusers, and that race and sex might impact on these proportions. Further, it was predicted that drinking in most cases preceded the regular intake of heroin (as concluded in the NDACP Final Report, National Institute on Drug Abuse 1980).
2. *Preferred Patterns of Substance Abuse*. The author assumed that given the potential of opiates for producing euphoria, substance users would come to prefer these drugs to alcohol. The high incidence of concurrent alcohol/opiate use described in the literature also pointed to the likelihood of the continued use of alcohol following drug addiction either for enhancement, as a substitute, or for other purposes.
3. *Sequence of Alcohol/Opiate Use*. Sequence patterns were explored in order to further elaborate upon the hypothesis—already advanced in (1)—that drinking usually precedes significant drug abuse.
4. *Arrest/Incarceration Records*. It was predicted that the economic demands and unstable lifestyle inherent in regular alcohol/heroin abuse would result in a higher frequency of confrontations with the law.

Methodology

As almost all of the contemporary abusers admitted to regular (daily for at least a month) use of opiates—usually heroin—but not all similarly used alcohol, the subpopulations were defined somewhat

TABLE 14.—*Regular heroin/alcohol users versus regular heroin users by sex and race cohorts, South Florida in-treatment sample*

Sex/race cohorts	Regular users heroin/alcohol		Regular heroin not alcohol		Total regular heroin users	
	n	Percent	*n*	Percent	*n*	Percent
Sex/race:						
White males	33	35.9	28	30.4	61	33.2
White females	14	15.2	17	18.5	31	16.8
Black males	34	37.0	30	32.6	64	34.8
Black females	11	12.0	17	18.5	28	15.2
Total	92	100.1[1]	92	100.0	184	100.0
Sex:						
All males	67	72.8	58	63.0	125	67.9
All females	25	27.2	34	37.0	59	32.1
Total	92	100.0	92	100.0	184	100.0
Race:						
All whites	47	51.1	45	48.9	92	50.0
All blacks	45	48.9	47	51.1	92	50.0
Total	92	100.0	92	100.0	184	100.0

[1] Percentage do not actually total 100 because of rounding.

differently from the NDACP sample. The total population of the treatment programs at the time of interview (August 1977) was distributed as follows:

Regular users of both heroin and alcohol	92	(47.9 percent)
Regular users of heroin but not alcohol	92	(47.9 percent)
All other drug/ frequency combinations	8	(4.2 percent)
Total	192	(100.0 percent)

A sex/race comparison of the regular users of heroin who did and did not drink regularly (table 14) did produce statistically significant differences: addicts who consumed both substances rather than heroin alone tended to be male more frequently.[8]

The inquiry was then narrowed down to those 92 persons who regularly abused both heroin and alcohol. This study population of combined regular users is characterized in table 15.

In the interest of further comparisons, NDACP data as presented in tables 3 and 4 may be contrasted with the South Florida findings. In the former samples, there were a greater proportion of men—83 percent males to 16 percent females—and blacks (66 percent blacks to 29 percent whites).

Psychological and Physical Dependence

This treatment sample of heroin addicts who were also regular users of alcohol provides analysts with some insight into the prevalence of self-reported psychological and/or physical dependence on alcohol among heroin/alcohol abusers. (See table 16.) In brief, physical dependence was defined as experiencing physical withdrawal distress when not drinking, and psychological dependence as being daily drinking with the person missing the alcohol and feeling a "need" for it when not drinking every day. The interviewers were instructed to avoid descriptions which included additional concepts that might require definitions, such as compulsive drinking.

- Of these heroin/alcohol abusers 34.8 percent reported they had at some time been *psychologically dependent on alcohol*. By contrast, only 20.5 percent of regular heroin/alcohol abusers in NDACP reported such dependency.
- Thirteen percent of all these heroin/alcohol abusers reported they had at some time been *physically addicted to alcohol*. The corresponding NDACP cohort reported a higher—20.5 percent—rate of physical addiction.
- White heroin/alcohol abusers in the Florida sample more frequently reported psychological dependence on alcohol than did blacks (42.6 versus 26.7 percent). This difference was statistically significant.[9] Self-reports of

TABLE 15.—*Age cohorts for regular users of heroin and alcohol, South Florida in-treatment sample*

Sex/race cohorts	Percent	$\overline{X}$ Age	Range
Sex/race:			
White males (33)	35.9	27.2	18–43
Black males (34)	37.0	25.2	19–35
White females (14)	15.2	25.9	19–37
Black females (11)	12.0	28.0	20–38
Sex:			
All males (67)	72.8	26.2	18–43
All females (25)	27.2	26.8	19–38
Race:			
All whites (47)	51.1	26.9	18–43
All blacks (45)	48.9	25.9	19–38
Total sample (92)	100.0[1]	26.4	18–43

[1] The total of the sex/race cohort is not 100 percent because of rounding. All other cohort totals do equal 100 percent.

TABLE 16.—*Psychological and physical addiction to alcohol by heroin addicts, South Florida in-treatment sample*

Sex/race cohorts	Psychological dependence on alcohol (percent)	Physical addiction to alcohol (percent)
Sex/race:		
White males (33)	42.4	18.2
Black males (34)	23.5	8.8
White females (14)	42.9	
Black females (11)	36.4	27.3
Sex:		
All males (67)	32.6	13.4
All females (25)	40.0	12.0
Race:		
All whites (47)	42.6	12.8
All blacks (45)	26.7	13.3
Total sample (92)	34.8	13.0

---

[8] A z test comparison revealed the significance of this difference ($z = 2.07$, $p = .02$).

[9] A z test for comparison revealed the significance of this difference ($z = 2.31$, $p < .01$).

TABLE 17.—*Percent of regular alcohol/opiate users preferring alcohol to get "high," South Florida in-treatment sample*

Sex/race cohorts	Percent
Sex/race:	
White males (33)	15.2
Black males (34)	11.8
White females (14)	7.1
Black females (11)	18.2
Sex:	
All males (67)	13.4
All females (25)	12.0
Race:	
All whites	12.8
All blacks (45)	13.3
Total sample (92)	13.0

physical addiction to alcohol were essentially the same for both white and black heroin/alcohol abusers (12.8 and 13 percent).

- Female heroin/alcohol abusers in this sample more frequently reported psychological dependence on alcohol than did males (40 versus 32.8 percent). This difference, however, was not statistically significant.
- Physical addiction to alcohol was essentially the same for heroin/alcohol abusers of both sexes (12 percent females and 13.4 percent males).

Among those heroin addicts who reported they had also been physically addicted to alcohol, the following profile was determined:

- Prior to *any* use of heroin, 58.3 percent were regular drinkers.
- Seventy-five percent were regular drinkers prior to the *regular* use of heroin.
- Twenty-five percent were physically addicted to alcohol *before* becoming addicted to heroin, 33.3 percent became addicted to alcohol *after* heroin, and 41.7 percent were addicted to alcohol *both before and after* becoming addicted to heroin.
- Among these addicts, 83.3 percent had been treated for their alcohol addiction, and 80 percent of these treatments occurred prior to any treatment admission for heroin addiction.
- The following *mean ages* for specific significant events in the lives of these "dual addicts" were computed:

Alcohol onset	13.8
Regular alcohol use	18.4
Heroin onset	19.4
Regular heroin use	20.3
First drug treatment	23.6
Current age	28.3

Preferred Patterns of Combined Alcohol and Heroin Use

The inquiry aimed at identifying preferred patterns of combined alcohol and heroin use generated the following results:

- Once addicted to heroin, most heroin/alcohol abusers come to *prefer* heroin to alcohol as a drug to get "high". As shown in table 17, only 13 percent of the study groups reported there had been any time after they had first used heroin that they still *preferred* to drink to get high. (Similarly, the majority of regular alcohol/heroin users in NDACP—49.1 percent—preferred heroin to alcohol; only 10.3 percent preferred alcohol.)
- Heroin addicts, however, do continue to drink after becoming addicted. Some continue to drink heavily. In this study group of heroin/alcohol abusers, 67.4 percent reported that even when they were using heroin most heavily they continued to drink regularly (table 18). The difference between males and females was statistically significant ($Z = 2.29$, $p < .01$).
- The reader is referred to table 1, which summarizes previous findings and indicates the prevalence of heavy drinking after onset of drug addiction. This contemporary treatment population greatly exceeds the drinking levels reported by earlier investigators. The *concurrent* use of heroin and alcohol was found to be quite high in this study population, as shown in table 19. For example, 78.3 percent reported they had used heroin while they were already high on alcohol, and 72.8

TABLE 18.—*Percent of regular alcohol/opiate users drinking heavily after onset of drug addiction, South Florida in-treatment sample*

Sex/race cohorts	Percent
Sex/race:	
White males (33)	75.8
Black males (34)	67.6
White females (14)	64.3
Black females (11)	45.5
Sex:	
All males (67)	71.6
All females (25)	56.0
Race:	
All whites (47)	72.3
All blacks (45)	62.2
Total sample (92)	67.4

TABLE 19.—*Percent of regular alcohol/opiate users reporting concurrent use of both substances, South Florida in-treatment sample*

Sex/race cohorts	Used heroin while high on alcohol	Drank a lot while high on heroin
Sex/race:		
White males (33)	81.8	75.8
Black males (34)	73.5	76.5
White females (14)	85.7	78.6
Black females (11)	72.7	45.5
Sex:		
All males (67)	77.6	76.1
All females (25)	80.0	64.0
Race:		
All whites (47)	83.0	76.6
All blacks (45)	73.3	68.9
Total sample (92)	78.3	72.8

percent reported they had sometimes drunk a lot while they were high on heroin. (Here the NDACP cohort of regular opiate/alcohol users present a contrast: Only 28 percent reported ever using alcohol to boost the effects of heroin.)

The sex and race differences shown in table 19 were not found to be statistically significant.

- The use of alcohol as a temporary substitute to eliminate pain and anxiety when heroin could not be obtained was reported by 65.2 percent of the South Florida study group (table 20). The white addicts reported this pattern of temporary substitution significantly more than the black addicts.[10]
- The use of alcohol also has a role within another context of self-treatment. In this study group, 58.7 percent reported they drank a lot while trying to kick a habit without entering a program (table 21). As with the preceding form of self-treatment, this pattern of substitution during detoxification was significantly more often found among white addicts.[11]

TABLE 20.—*Percent of regular alcohol/opiate users reporting alcohol use as a temporary substitute for heroin, South Florida in-treatment sample*

Sex/race cohorts	Percent
Sex/race:	
White males (33)	75.8
Black males (34)	52.9
White females (14)	78.6
Black females (11)	54.5
Sex:	
All males (67)	64.2
All females (25)	68.0
Race:	
All whites (47)	76.6
All blacks (45)	53.3
Total sample (92)	65.2

TABLE 21.—*Percentage of regular alcohol/opiate users reporting alcohol use as a substitute during drug detoxification, South Florida in-treatment sample*

Sex/race cohorts	Percent
Sex/race:	
White males (33)	69.7
Black males (34)	41.2
White females (14)	78.6
Black females (11)	54.5
Sex:	
All males (67)	55.2
All females (25)	68.0
Race:	
All whites (47)	72.3
All blacks (45)	44.4
Total sample (92)	58.7

Sequence of Alcohol and Heroin Use

Not unexpectedly, the South Florida treatment sample of heroin addicts who had also been regular drinkers confirms the earlier conclusion that regular drinking normally precedes heroin use. As shown in table 22, in this study population, 77.2 percent were regular drinkers before *any* heroin use and 84.8 percent were regular drinkers before *regular*

---

[10] A chi-square comparison test revealed the significance of the difference (x^2 = 5.48, p = < .02)

[11] A chi-square comparison test revealed the significance of this difference (x^2 = 7.37, p = < .01).

TABLE 22.—*Percent of regular alcohol/opiate users reporting regular drinking before heroin use, South Florida in-treatment sample*

Sex/race, cohorts	Regular alcohol use before any heroin use	Regular alcohol use before regular heroin use
Sex/race:		
White males (33)	78.8	87.9
Black males (34)	76.5	85.3
White females (14)	78.6	85.7
Black females (11)	72.7	72.7
Sex:		
All males (67)	77.6	86.6
All females (25)	76.0	80.0
Race:		
All whites (47)	78.7	87.2
All blacks (45)	75.6	87.2
Total sample (92)	77.2	84.8

heroin use. (Regular alcohol/heroin users in NDACP reported a lesser rate—54.2 percent—of regular alcohol use before heroin.)

A comparison of mean ages at which various significant events occurred indicates a consistent sequencing of these events in all sex/race cohorts. The following mean ages were computed for both the South Florida and the NDACP regular user populations:

	South Florida	*NDACP*
Onset of alcohol use	14.3	14.2
Onset of regular alcohol use	18.0	20.4
Onset of heroin use	19.6	18.9
Onset of regular heroin use	20.1	20.4

- It appears that drinking occurred quite early for both groups and that regular drinking also was early—particularly for the South Florida sample.
- It appears the lag between first heroin use and regular use is much shorter than the lag from alcohol onset to regular drinking, particularly for the South Florida population. Consider the mean ages for the SF group, by cohort (table 23); it is also of interest to note that males begin to drink regularly significantly earlier than females.[12]

Prevalence of Arrest and Incarceration

Not unexpectedly, a significant majority of these combined heroin/alcohol abusers were found to have been arrested (90.2 percent) and incarcerated (75 percent)—see table 24. (Percentage for NDACP regular opiate/alcohol users are quite similar: 90.1 and 78.4 percent.) When cohort comparisons were made, blacks had been arrested and incarcerated significantly more often than whites, and males had a higher prevalence for both than females.

- Among those who had been arrested, the majority had experienced their first arrest prior to using heroin on a regular basis (table 25). (Again, the corresponding NDACP sample was similar: 70.3 percent of regular users had such arrests compared with SF's 65.1 percent.) As one would expect, this sequence was more associated with males than females and blacks more than whites.[13]

Comment

This study population yielded valuable data on psychological and physical dependence among multiple substance users. As assumed, psychological dependence on alcohol was greater (35 percent) than physical dependence (13 percent) among regular users. However, drinking remained significant for this cohort: 58 and 75 percent drank substantially prior to first and regular use of heroin, respectively—and drinking during addiction remained

---

[12] A chi-square comparison test between the sexes controlling for less than age 18 versus more than 18 revealed the significance of the difference ($\chi^2 = 5.00$; $p = < .05$).

[13] A chi-square comparison revealed the significance of the sex differences ($\chi^2 = 4.83$; $p = < .05$) while a z test comparison revealed the significance of the race difference ($z = 1.77$; $p = .04$).

TABLE 23.—*Lag of first to regular use of substances for regular alcohol/opiate users, in years, South Florida in-treatment sample*

Sex/race cohorts	Alcohol		Heroin	
	Onset	Regular use	Onset	Regular use
Sex/race:				
White males (33)	13.9	17.2	20.8	20.9
Black males (34)	13.6	17.9	18.4	19.5
White females (14)	14.9	19.0	20.4	20.9
Black females (11)	16.2	19.2	18.8	19.2
Sex:				
All males (67)	13.7	17.3	19.6	20.1
All females (25)	15.8	19.1	19.7	20.2
Race:				
All whites (47)	14.2	17.7	20.7	20.8
All blacks (45)	14.4	18.2	18.5	19.4
Total sample (92)	14.3	18.0	20.1	22.8

TABLE 24.—*Percent of regular alcohol/opiate users ever arrested and incarcerated, South Florida in-treatment sample*

Sex/race cohorts	Percent ever arrested	Percent ever incarcerated
Sex/race:		
White males (33)	87.9	75.8
Black males (34)	100.0	91.2
White females (14)	64.3	28.6
Black females (11)	100.00	81.8
Sex:		
All males (67)	94.0	83.6
All females (25)	80.0	52.0
Race:		
All whites (47)	80.9	61.8
All blacks (45)	100.0	88.9
Total sample (92)	90.2	75.0

significantly high (67 percent). After the onset of addiction, multiple substance users tend to use alcohol as an enhancer and substitute for heroin, rather than as a euphoria-producing substance. This use of alcohol as a substitute was more true of whites than blacks.

Data on age of first and regular substance use revealed expected sequence patterns. Further, the widespread introduction to and regular use of alcohol by persons prior to age 18 points to the common access to large quantities of alcoholic beverages by minors. Progression from alcohol onset to regular use appears to take about 4 years; however, the progression from onset to regular heroin use is about half that amount of time. These findings have significant implication for intervention; prevention of alcoholism must be directed at very young populations with the thought that these individuals may be considerably at risk to abuse other substances (i.e., heroin). Early identification and remediation is probably more realistic for alcohol abusers than for heroin abusers.

TABLE 25.—*Percent of arrested regular alcohol/opiate users arrested previous to regular heroin use, South Florida in-treatment sample*

Arrestee cohorts by sex/race	Percent of arrestees with arrest preceding regular heroin use
Sex/race:	
White males (29)	69.0
Black males (34)	79.4
White females (9)	22.2
Black females (11)	45.5
Sex:	
All males (63)	74.6
All females (20)	35.0
Race:	
All whites (38)	57.9
All blacks (45)	71.7
All arrestees (83)	65.1

While arrest rates were expectedly high for the regular users, the majority of arrests occurred before the regular use of heroin. This finding raises theoretical questions about the impact of drug use on crime. It also suggests that early intervention would be applicable to law enforcement agencies as well as personnel concerned with treatment.

ACTIVE HEROIN ABUSERS WHO DRINK REGULARLY: SOUTH FLORIDA

As mentioned previously, descriptions of active multiple substance users were chosen to be the third major component of this chapter because of distinct advantages not available in the previous two samples. It has often been felt by social scientists that "captured" addict populations—i.e., those in treatment—differ in significant ways from drug abusers at large. Active addicts can be expected, for example, to have different attitudes towards rehabilitation and lesser degrees of social/physical dysfunction than their "captured" cohorts.

With these advantages in mind, the author obtained substantial information on an active drug abuse population (described under Methodology) in regard to demographics, multiple drug use patterns, drug of preference; criminal behavior, adverse drug reactions, and attitudes toward treatment. The hypotheses were as follows:

1. *Demographics*. It was expected that active users have sex, race, and age characteristics resembling users in treatment in the same geographic area.
2. *Multiple drug use patterns*. It was expected that multiple substance use would not be limited to abuse of opiates and alcohol, but include substantial numbers of other agents as well.
3. *Drug of preference*. Although opiates and alcohol were by definition preferred by the subjects, it was presumed that a significant minority of the group might prefer other substances.
4. *Criminal behavior*. As the subjects interviewed were heavily involved in a drug subculture, the author had access to considerable data relating to ongoing criminality. This information base was searched to find evidence of (a) the prevalence of criminality; (b) illegal activity as a primary means of support; (c) drug selling as a major component of illegal activity; and (d) the prevalenceof arrests.
5. *Arrest history*. Given the study population, a high incidence of previous arrests was assumed; it also seemed probable that such arrests would be significantly related to drug law violations.
6. *Adverse drug reactions*. High frequency consumption of either alcohol or heroin is normally associated with adverse *physiological* reactions. When both substances are used regularly, a significant number of adverse reactions would be expected. This expectation would be particularly apt for active heroin users, who are subjected to the impurity and inconsistent availability of street drugs.
7. *Attitude toward treatment*. Active substance abusers appeared likely to differ substantially from their in-treatment cohorts by virtue of negative or indifferent attitudes toward treatment.

Methodology

During the period 1974–76, the author directed a series of studies which identified *active* drug abusers in five South Florida cities. These subjects were interviewed to obtain general information on lifestyle with special reference to ongoing drug taking habits and criminality. Of 1,421 active drug abusers interviewed, 317 (22 percent) were currently regular users of heroin and regular consumers of alcohol. *Regular heroin use* was defined as having used heroin at least daily for 1 week during the month previous to the interview. *Regular drinking* was defined as drinking almost daily, but at least daily for one week, during the month previous to the interview.[14]

Penetration into the drug-using subculture where persons were identified and interviewed was accomplished in the following manner:

1. An active abuser or former abuser previously known to the interviewer was approached to "broker" the penetration by introducing the interviewer to a currently active drug abuser.

---

[14] These definitions of regular use do differ from those used in the NDACP and the contemporary treatment populations. This occurred as the result of independent design and inquiry, and the data could not be regrouped for identical analyses.

TABLE 26.—*Distribution for active versus in-treatment alcohol/opiate users*

	Alcohol opiate users, in percent	
Current age	Active ($n = 317$)	In treatment ($n = 92$)
15–18	10.1	1.1
19–21	24.0	14.1
22–25	32.8	33.7
26–30	17.4	35.9
31–40	10.7	14.1
Over 40	5.0	1.1
15–25	66.9	48.9
Mean (years)	24.6	26.4
Median (years)	23	25

2. Upon completion of the interview, the respondent was asked to introduce the interviewer to another respondent; this process was continued for the entire sample.
3. The interviews were conducted by former users who had undergone extensive training in interviewing techniques. Although no interview form was completed during the actual interview, a guide had been memorized by the interviewer who filled in a standard data recording form as soon as physically possible once the interview was completed.

These procedures, techniques, and instruments had been employed by the author and his interviewers in some 80 cities throughout the country during the same general time period (1973–76).

While one must acknowledge that the representativeness of these currently active but "hidden" drug abusers cannot be specified (no attempt was made to systematically identify and interview *every* drug abuser in the five communities), one can conclude that the sample is a valid base offering significant numbers with which to examine the given hypotheses.

Demographics

The currently active heroin/alcohol abusers in South Florida are in most respects demographic twins to contemporary heroin/alcohol abusers being seen in drug treatment programs in the same geographic area (see the previous section).

- The sex distribution was essentially the same in both groups, although the active substance abusers had slightly more males than did those in treatment (77.6 percent versus 72.8 percent).
- Although there was a greater proportion of blacks in the treatment versus the active populations (48.9 percent versus 39.4 percent), the differences were not statistically significant.
- Not unexpectedly, those currently active were significantly younger than the heroin/alcohol abusers who had sought treatment (see table 26).[15]

Multiple Substance Use Patterns

An overwhelming majority of respondents in both groups were introduced to narcotics with heroin (97.8 percent in the treatment sample and 99.1 percent among those still active). Beyond use of this substance, one must expect along with most analysts the multiple substance pattern of abuse among contemporary heroin abusers. A significant majority (both the active and in-treatment groups) began their drug use with alcohol (81.5 percent in the treatment sample and 79.2 percent among those still active). Moreover, data obtained from the active heroin/alcohol abusers reconfirm the use of many drugs by persons who regularly abuse heroin. When the respondents were asked to indicate which drugs other than heroin and alcohol they had used during the preceding 60 days, *everyone* reported some additional drug use.

- Two hundred fifty-three (79.8 percent) had smoked marijuana and 100 (31.5 percent) had used other cannabis products.
- One hundred sixty-seven (52.7 percent) had used cocaine.

---

[15] A chi-square comparison test revealed the significance of this difference ($\chi^2 = 7.00$; $p = < .01$).

- One hundred thirty-seven (43.2 percent) had used a prescription narcotic, and 74 (23.3 percent) had used illegal methadone.
- One hundred twenty-five (39.4 percent) had used one or more of the barbiturates, 70 (22.1 percent) had used one of the methaqualone products, and 62 (19.6 percent) had used some other sedative.
- Eighty-five (26.8 percent) had used one or more of the amphetamines, and 10 (3.2 percent) had used a nonamphetamine stimulant—usually phenmetrazine (Preludin).
- Sixty-nine (21.8 percent) had used one or more of the psychedelics.
- Four (1.3 percent) had used an inhalant.

Drug of Preference

Although all of the 317 active heroin/alcohol abusers were almost daily users of both heroin and alcohol and although most of them were using a variety of other drugs, there was considerable variance noted in the reporting of the drug one would currently use if given a choice. For example, as shown in table 27, one in three preferred to abuse substances other than heroin and alcohol—and presumably did as availability and other constraints allowed.

TABLE 27.—*Current drug of choice among active alcohol/opiate abusers*

Activities	*n*	Percent
Heroin	203	64.0
Other narcotics	13	4.1
Cannabis products	48	15.1
Other hallucinogens	9	2.8
Cocaine	22	6.9
Sedatives	13	4.1
Stimulants	3	0.9
Inhalants	1	0.3
Alcohol	5	1.6
Total	317	100.0[1]

[1] Percentages do not actually total 100 because of rounding.

Criminal Behavior

As mentioned at the beginning of this section, the author was interested in assessing the study group's involvement with criminality—particularly in regard to types of illegal activity and their relationship to means of support. For these purposes, two analyses were made. The first involves the distribution of recent criminal activities among the active heroin/alcohol addicts who had recently committed a crime; the second relates to the distribution of recent principal illegal activities among heroin/alcohol abusers who reported crime as the primary means of economic support.

Extent of Criminality

One obvious advantage to accessing active heroin addicts in order to assess behaviors is that recall is not a problem. Questions can be framed in the present and behaviors can be related contemporaneously. Such was the case with these active heroin/alcohol abusers when they were asked to report all of their recent crimes excluding only those directly related to personal drug use—e.g., possession, etc. As expected, the majority (73.8 percent, $n = 234$) reported the commission of crimes during the 60-day period preceding the interview. Among these individuals, criminal activities were distributed as follows:

	Percent
Sold drugs	73.9
Were involved in commercial vices (e.g., prostitution, procuring, gambling, etc.)	17.5
Committed burglaries	16.7
Shoplifted	13.2
Committed armed robberies	5.6
Forged checks	3.4
Stole automobiles	1.3
Committed other property thefts	6.0
Committed other crimes against persons	6.0
Committed other crimes (e.g., con games)	4.7

These data are quite conclusive: The most prevalent illegal means of obtaining money or goods for drugs or for other general support purposes by these individuals was the selling of drugs.

Criminality as a Primary Means of Support

Not unexpectedly, when primary means of financial support were determined for the 60-day period prior to interview, criminality was quite prevalent;

in this regard, 64.4 percent ($n = 204$) reported themselves as primarily addict-criminals. Further, of those with legal means of support (35.6 percent), only 22.1 percent were employed; the rest were maintained by family, friends, welfare, or other sources.

An analysis was conducted to determine what form of illegal activity each of the 204 addict-criminals concentrated upon as their primary means of support (table 28). While there is an extensive literature stating and implying that property crimes and commercial vices are the most common means of supporting one's "habit" or "lifestyle", the *primary* illegal activity among these addict-criminals was selling drugs. Almost 53 percent of these individuals reported such activity, while 34.1 percent of all the combined heroin/alcohol abusers reported drug selling as their primary means of support. It should also be noted that offenses against property or person constituted less than 30 percent of crimes committed for primary means of support.

TABLE 28.—*Distribution of principal illegal activities among alcohol/opiate abusers whose primary means of support was illegal*

Activities	n	Percent
Drug selling	108	52.9
Commercial vices	36	17.6
Burglary	22	10.8
Shoplifting	11	5.4
Auto theft	3	1.4
Forgery	3	1.4
Other property crimes	9	4.4
Armed robbery	2	1.0
Other crimes against persons	8	3.9
Other	2	1.0
Total	204	100.0[1]

[1] Percentages do not actually total 100 because of rounding.

The professional literature is inconclusive and even somewhat contradictory regarding crime specialization among addict-criminals. Data obtained from the study sample indicate there is considerable variation in at least one measure of specialization—viz, the degree to which a specific criminal activity is depended upon as the primary means of support. For those individuals identified with a specific criminal activity, the following were involved for reasons of main economic support:

- Three of the automobile thieves;
- Thirty-six (87.8 percent) of the 41 addict-criminals who were prostitutes, procurers, or gamblers;
- One hundred eight (62.8 percent) of the 172 drug sellers;
- Twenty-two (56.4 percent) of the 39 burglars;
- Three of eight (37.5 percent) of all the forgers and 11 of 31 (35.5 percent) shoplifters; and
- Two of thirteen (15.4 percent) of the armed robbers.

At least within this population of active heroin/alcohol abusers, 73.8 percent of the study population were criminals (i.e., reported recent criminal activity). Drug selling was the most prevalent criminal activity among all of the addict-criminals, and drug selling was the most prevalent criminal activity among these addict-criminals who engaged in criminal activities as their primary means.

Arrest History

An analysis of the arrest activity among these active heroin/alcohol abusers for the 60-day period prior to interview indicates substantial risk for the heroin/alcohol group at large as well as individuals identified with specific criminal activities:

- Almost one in five of the active heroin/alcohol abusers had been arrested at some time during this period (59 of 317).
- Almost one in four of those who had been arrested had been arrested more than once (14 of 59).
- Arrests for violations of specific drug laws were the most prevalent (40.7 percent of everyone who was arrested).
- Of everyone at risk for arrest for drug law violations, 7.6 percent were arrested (24 of 317).
- Of those engaged in committing property crimes—e.g., burglary, shoplifting, etc.—15.8 percent were arrested (15 of 95), and 6.3 percent were arrested more than once.
- Of those engaged in the commission of crimes against persons—e.g., armed robberies, muggings—22.2 percent (6 of 27) were arrested, and 3.7 percent were arrested more than once.
- Of those engaged in the commercial vices—e.g., prostitutes, procurers, gamblers—34.1 percent were arrested (14 of 41).

These data would indicate the arrest liability among active heroin/alcohol abusers is quite high. One might expect 20 percent of this population to be arrested in any given 60-day period. As hypothesized, arrest liability was the greatest for crimes where drug laws were violated.

Adverse Drug Reactions

As mentioned earlier, a significant number of adverse reactions were expected; such was the case. Of the 317 heroin/alcohol abusers, 279 (88 percent) had at some time experienced an adverse reaction associated with heroin use, and 12 percent had had such an experience in the 60 days prior to interview. Of the recent reactions, about half were due to overdose and half to infections, allergies, panic, etc.

These data suggest that during any given 60-day period, some 6 percent of similar active heroin/alcohol abusers could experience an overdose to the heroin, and an additional 6 percent will experience some other adverse physical or psychological reaction. The data also suggest that given sufficient time, almost every heroin/alcohol abuser will suffer some adverse physical or psychological effect because of their pattern of abuse.

Attitude Toward Treatment

Although preceding sections suggest that active alcohol/opiate abusers face significant risks for arrests and adverse reactions that might make a formal treatment appear attractive, such was not the case. The findings below, on the total sample of active alcohol/opiate abusers, substantiate the original hypothesis of a negative attitude toward treatment:

- One hundred thirty-four (42.3 percent) did not believe they needed any kind of treatment.
- Seventy-eight (24.6 percent) felt they might need treatment, but the programs available to them were inappropriate, ineffective, or otherwise undesirable.
- Sixty-one (19.2 percent) indicated they would take a treatment slot if it were offered to them, although they had made no attempt to seek admission into any program.
- Forty-four (13.9 percent) had requested treatment during the preceding 60 days, and 33 of them had been placed on a waiting list; the remaining 11 reported that their applications had been denied.

It should be noted that the cities where these active heroin/alcohol abusers lived offered a wide variety of multi-modality services which were readily available to the vast majority of these respondents. Nonetheless, only one in seven of these active heroin/alcohol abusers had even inquired about treatment during the preceding 60 days.

Comment

This study was not only valuable for comparisons with its corresponding cohort in treatment, but also provided unique data in its own right. The active substance abusers were demographically similar to in-treatment abusers except for being slightly younger (one could therefore infer that substances abusers tend to seek treatment only after efforts at self-rehabilitation had failed).

In regard to patterns of multiple drug use, the intake of a variety of substances other than heroin and alcohol was the rule rather than the exception. Almost 80 percent smoked marijuana, half used opiates other than heroin, and over a third used barbiturates. As almost one in three preferred to use a substance other than heroin, one can assume that this prevasive pattern of drug taking may be related to availability factors.

The hypothesis concerning widespread criminality was verified. A majority of the active regular abusers of heroin and alcohol supported themselves primarily by crime; however the most prevalent crimes were victimless—i.e., the selling of drugs, prostitution, etc. Over a third of *all* regular abusers reported drug selling as a primary means of support, and over half of those living through illegal means were primarily drug sellers.

The high cost of substance abuse was substantiated through evidence of high arrest liability (some 20 percent of the sample are arrested in a given 60-day period), and high adverse reaction liability (12 percent suffer such a reaction during the same time frame).

Finally, active substance abusers do have significantly negative attitudes toward treatment efforts: at least two-thirds of the sample either felt that treatment was unnecessary or that current treatment sources were inappropriate, ineffective, or otherwise undesirable. It seems likely, then, that multiple substance users as represented by this sample are difficult to treat and motivate in their present setting. One can only hope that, pending remediation of the conditions that brought the abuse patterns into being, the experience of multiple substance abusers who successfully complete treatment and return to their original environments will impact on their active cohorts.

CONCLUSIONS AND IMPLICATIONS

In this chapter the issue of concurrent abuse of alcohol and opiates, especially heroin, has been addressed. A goal to describe those persons who regularly abuse both alcohol and opiates has been accomplished. Where possible, significant differences between those who *do* abuse both substances and those who *do not* were established. In order to accomplish these tasks, information was obtained and analyzed from three separate study populations:

- Abusers in treatment as part of the National Drug/Alcohol Collaborative Project which consisted of a diverse sample;
- Abusers who were currently undergoing treatment for heroin abuse but who also had "drinking histories" (four South Florida programs); and
- Active heroin abusers who were not in treatment (South Florida).

Each study population was included to mitigate possible biases in "representativeness" and to contribute unique information which was not available in the other two study populations.

These descriptive and comparative analyses resulted in the isolation of several characteristics of the combined alcohol and opiate abusers. Significant among these were:

- This specific pattern of combined substance abuse is probably much more prevalent than it was in the past.
- Not unexpectedly, those who were found to be regularly abusing these two substances were older, as a group, than those who did not.
- Black involvement in this pattern of combined substance abuse is much more prevalent than among nonblacks.
- Sex is probably not a very potent predictor of involvement in this specific pattern of substance abuse. As expected, more males were found to be combined alcohol/opiate abusers, but the sex ratio between those who abuse both and those who do not probably remains fairly constant.
- Accepting the known bias of studying groups who are seeking treatment in urban settings, the data indicate that risk for such combined abuse is higher among persons who were reared by their mothers alone and/or among persons from the lower socioeconomic groups in our large urban centers.
- The sample of contemporary combined substance abusers appeared to more frequently acknowledge a psychological dependence on alcohol but to less frequently acknowledge a physical dependence on it.
- Among contemporary heroin addicts who also acknowledge a physical addiction to alcohol, the alcohol addiction most frequently spans a time period *before* and *after* the onset of heroin addiction. Once a person becomes addicted to heroin s/he will normally prefer heroin to alcohol but will continue his/her alcohol abuse pattern. In fact, most will use the two drugs concurrently, i.e., using the other while still high on one.
- The use of alcohol as a temporary substitute to eliminate pain and anxiety when heroin is not available is common among all addicts but is probably more prevalent among white heroin abusers than among nonwhites. The same pattern is also prevalent among those trying to "kick" heroin habits both in programs and on the street.
- The "costs" associated with combined alcohol and heroin abuse are high. For example, almost everyone will be arrested and three-fourths will be incarcerated. There are indications, however, the majority of arrests occur *prior* to the regular use of heroin. Additionally, during any given 60-day period, some 12 percent will probably experience some adverse physical or psychological reaction to this abuse. Given sufficient time, almost none will escape the onset of these reactions
- Although most of the crimes committed by these combined abusers are "victimless," the fact remains that the criminal justice system has the first contact with abusers. This implies, at least to this writer, that appropriately designed and managed programs which would divert abusers into treatment programs early in their careers would be the most effective intervention technique.
- Of particular concern to program planners and managers, more than 40 percent of these com-

> bined abusers who are still actively abusing drugs do not believe they need any kind of treatment and an additional 25 percent feel they need treatment but assert the *current treatment services available to them are inappropriate, ineffective, or otherwise undesirable.*

In conclusion, we seem to be faced with an increasing problem, especially in our larger urban centers and among our poorer citizens. They can be expected to continue to place an ever-increasing burden on all of our social institutions, but especially on our criminal justice system. At least from the perspective of the abusers, we have little to offer them in the way of treatment assistance in ceasing their drug-abusing lifestyles.

REFERENCES

Babst, D. V.; Chambers, C. D.; and Warner, A. Patient characteristics associated with retention in a methadone maintenance program. *British Journal of Addictions,* 66:195-204, 1971.

Chambers, C. D.; Cuskey, W. R.; and Wieland, W. F. Predictors of attrition during the outpatient detoxification of opiate addicts. *Bulletin on Narcotics,* 22(4):43-48, 1970.

Chambers, C. D., and Inciardi, J. A. *A Post-treatment Evaluation of Phoenix House Splitters.* New York: Phoenix House Foundation, Inc., 1974.

Cohen, A. Alcohol and heroin: Structural comparisons of reasons for use between drug addicts and alcoholics. *Annals of the New York Academy of Sciences,* 273:605-612, 1976.

Gearing, F. R. Successes and failures in methadone maintenance treatment of heroin addiction in New York City. In: *Proceedings of the 3rd National Conference on Methadone Treatment,* Washington, D.C.: NAPAN 1970. pp. 2-16.

Goldstein, A., and Judson, B. A. Efficacy and side effects of three widely different methadone doses. In: *Proceedings of the 5th National Conference on Methadone Treatment.* Washington, D.C.: NAPAN, 1973. pp. 21-44.

Green, J., and Jaffe, J. H. Alcohol and opiate dependence: A review. *Journal of Studies on Alcohol,* 38(7):1274-1293, 1977.

Jackson, G. W., and Richman, A. Alcohol use among narcotic addicts. *Alcohol and Health,* 1973. pp. 25-28.

Kolb, L. *Drug Addiction: A Medical Problem.* Springfield, Ill.: Charles C Thomas, 1962.

Kreek, M. J. Medical safety and side effects of methadone in tolerant individuals. *Journal of the American Medical Association,* 223:665-668, 1973.

Ling, W., et al. A systematic study of heroin addicts. In: *Proceedings of the 5th National Conference on Methadone Treatment.* Washington, D.C.: NAPAN, 1973. pp. 429-432.

Maddux, J. F., and Elliott, B. Problem drinkers among patients on methadone. *American Journal of Drug and Alcohol Abuse,* 2(2):245-254, 1975.

Mezritz, M., et al. A follow-up study of successfully detoxified methadone maintenance patients. In: Senay, E., et al., eds. *Developments in the Field of Drug Abuse.* Cambridge, Mass.: Schenkman, 1974. pp. 132-142.

National Institute on Drug Abuse. *National Drug/Alcohol Collaborative Project: Issues in Multiple Substance Abuse,* Gardner, S. E., ed. DHEW Pub. No. (ADM) 80-957. Washington, D.C.: Supt. of Docs., U.S. Govt. Print. Off., 1980.

O'Donnell, J. A. A follow-up of narcotic addicts: Mortality, relapse and abstinence. *American Journal of Orthopsychiatry,* 34(5):948-954, 1964.

O'Donnell, J. A. A post-hospital study of Kentucky addicts: A preliminary report. *Journal of the Kentucky State Medical Association,* July 1963. pp. 573-577.

O'Donnell, J. A. *Narcotic Addicts in Kentucky.* Publication No. 1881. Washington, D.C.: Department of Health, Education, and Welfare. pp. 135-141, 1969.

Richman, A.; Jackson, G.; and Trigg, H. Follow-up of methadone maintenance patients hospitalized for abuse of alcohol and barbiturates. In: *Proceedings on the 5th National Conference of methadone Treatment,* March 17-19, 1973. Washington, D.C.: NAPAN, 1973. pp. 1484-1503.

Rosen, A.; Ottenberg, D. J.; and Barr, H. L. Patterns of previous abuse of alcohol in a group of hospitalized drug addicts. *Drug Forum,* 4(3):261-272, 1975.

Sample, C. J. Concept of polydrug use. In: Richards and Blevens, eds. *Epidemiology of Drug Abuse. NIDA Research Monograph.* 10. Washington, D.C.: National Institute on Drug Abuse, 1977. pp. 19-31.

Scott, N. R.; Winslow, W. W.; and Gorman, D. G. Epidemiology of alcoholism in a methadone maintenance program. In: *Proceedings of the 5th National Conference on Methadone Treatment,* March, 17-19, 1973. Washington, D.C.: NAPAN, 1973. pp. 284-287.

Taintor, Z., and D'Amanda, C. Multiple drug abuse in heroin addicts receiving outpatient detoxification. In: *Proceedings of the 5th National Conference on Methadone Treatment,* March 17-19, 1973. Washington, D.C.: NAPAN, 1973. pp. 1002-1009.

Vaillant, G. E. A twelve-year follow-up of New York narcotic addicts. IV: Some characteristics and determinants of abstinence. *American Journal of Psychiatry,* 123(5):573-585, 1966.

☆U.S. GOVERNMENT PRINTING OFFICE: 1981-341-166/6319